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ABSTRACT

This purpose of this journal is to document advances in the fields of health, education, food, diet, and development. Each issue contains an overview of a high-priority subject touching the everyday life of children, mothers, and families. This double issue describes the Andes project, a food, diet, nutrition, and development program conducted in nine rural communities in the Ecuadorian Andes and coordinated between French agencies and the Ecuadorian government. The first section introduces the Andes Project, including how and why it came into being. The second section addresses the program's diagnosis process, including community participation, sharing of information, and attitudes during diagnosis. The third section examines the region's core crop--maize--including its growing, cultivation, storage, consumption, threats to its survival, and efforts for protection of the crop. The fourth section describes the region's general health situation and the program's organization of health activities, public health tools, and family health records. The fifth section describes research into the nutritional situation in Ecuador and the large public health problem of iron-deficiency anemia, and describes an Andes bread program designed to combat the condition. The sixth section explores problems of water supply, both quantity and quality, and the seventh section describes the region's educational and school situation and the Andes response. The eighth section discusses Andes economic enterprises, such as the production of maize for sale and the establishment of community shops. The ninth section addresses the program's efforts in training and education in food and diet. The final section consists of summary discussions on topics of consumption, pluridisciplinarity, social organization, and the process of change. (SD)

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CHILDREN IN THE TROPICS

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FOOD, NUTRITION AND DEVELOPMENT IN ECUADOR

1995 - N° 220/221

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ICC was created by the French government in 1949, on the initiative of Professor Robert Debré in particular, following negociations between France and the United Nations. Its purpose was to furnish those international and national agencies dealing specifically with child care with training facilities and educational and informational tools in the field of child health and development, viewing children within their family and surroudings.

As for its legal status, the International Children's Centre is a foundation under french law of recognized public utility, administered by an executive board with broad international membership.

ICC soon turned essentially toward Third World children and devoted its activities to the training and education of personnel with social, educational and administrative responsibilities as well as medical and paramedical workers.The desire for greater efficiency has led it to work increasingly with trainers and to concentrate its efforts on the methodological and educational aspects of mother and child care programmes.

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CHILDREN IN THE TROPICS : A JOURNAL

This journal helps its readers to keep abreast of advances in knowledge and skills in the fields of health, education, food and diet and development, as well as in the planning and administration of programmes, and in methodological approaches to research and action. It is also an educational tool through which university teachers and people in charge of training may enhance their teaching programmes. Last, it is a place for sharing experience, definitely focussed on a comprehensive approach to problems, through participative, interdisciplinary action.

It contains an overview, as complete as possible, of a high-priority subject touching the everyday life of children, mothers and families.

It publishes 5 to 6 issues annually, in three languages : these vary in length from 40 to 80 pages, depending on the importance of the topics discussed.

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FOOD, NUTRITION AND DEVELOPMENT IN ECUADOR

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While it took the audacity of a few individuals to create Andes, the programme owes its development to the energetic contribution of a great many participants : families in village communities, the University, with its teachers and students, the Juan César García Institute, several ministries, the Fondation pour le Progrès de l'Homme and the International Children's Centre. None of what it has accomplished would have been possible without the deep involvement - professional, of course, but also personal - of each individual. There were too many people for us to mention them all here.

Hopefully this modest, incomplete presentation, reflecting the searchings and engagement of all of these people in favour of development, will continue to elicit exchanges and new experiments, so that the conceptions on which Andes was predicated will continue to progress, grow deeper and spread.

Dr. Anne-Marie Masse-Raimbault, Dr. Michel Chauliac, Pascale Gerbouin-Rerolle

ICC

The Juan César García Institute, named after the famous scientist who enabled the development of education in medicine and the social sciences applied to health in Latin America. The institute, an international agency according to Ecuadorian law, was created in 1984 in Quito. It not only collects, analyses and diffuses specialized information in the sciences of health and the social sciences, but also designs, performs and/or provides technical support for research and action programmes in these fields, does evaluation, organizes training sessions, publishes scientific works and encourages exchanges. Ecuadorian and foreign officials participate in the Institute as active or honorary members, or benefactors, in view of amplifying research on how to integrate the social sciences in health-oriented work and popularize achievements.

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The Charles Léopold Mayer Fondation pour le Progrès de l'Homme (FPH) is a foundation, according to Swiss law, created in 1982. Its action and reflexion focus on the links between the accumulation of knowledge of all sorts and the progress of mankind. With its extremely varied partners, located on all five continents, the FPH impels debate on how knowledge can be produced and mobilized to serve those people who suffer most from lack of access to it. It promotes meetings and joint working programmes, proposes a standardized system for exchanging information, supports work that capitalizes on experience and publishes or co-publishes books and dossiers.

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ACTING LOCALLY ... THINKING GLOBALLY ! *

PREFACE

The action conducted in rural communities in developing countries, in the framework of development programmes, cannot be conceived as a series of momentary acts, but must be viewed as elements in a process, threads, the leading strands which are weaving the future.

This is how we, actors in the Andes project set up in 1986, perceived the project, and still do ten years later. The Andes project - a developmental project focusing on food, diet and nutrition - was conducted in nine rural communities in the Ecuadorian Andes, each inhabited by thirty to fifty families with extremely precarious living conditions.

To bet on development, under these conditions, implied the adoption of the following principles :

- being prepared to work hand in hand with the inhabitants ;
- respecting their history, their culture and their ways of thinking ;
- giving priority to their most obvious needs ;
- acknowledging both their creativity and their differences ;
- accepting their types of organization, and the long-term validity of these ;
- estimating the work involved in their action at its true value ;
- supporting their combat against rejection.

To bet on the improvement of living conditions in these rural communities means considering that development is not a utopia. This requires a considerable dose of passionate involvement. It also demands acceptance of the fact that such action takes time : this requires a great deal of rigour.

To enable actors in a development programme - city-bred technicians on the one hand and peasants on the other - to acquire the ability to take the long term into account truly turned out to be a challenge, taken up with rigour and passion, as we have said, but also with tenacity and friendship. In addition to this challenge, there were doubts, inherent in any project of this type, intent on respecting popular aspirations : how can we succeed in generalizing these actions once they have succeeded locally, or, to use the parlance of the social sciences, how does one go from the micro to the macro ; that is, experiment locally and then diffuse the work more broadly, to the regional, national, and perhaps even international level ?

*** by Dr. Rodrigo Yépez, Head of the Andes programme and President of the Juan César García Institute**

This concern, heartily shared by Yves Hardy during his visits to Ecuador (1), suggests several remarks. Any development-centred action at the «micro» level cannot be meaningful unless it leads to at least two major processes at the «macro» level : it must produce transformations in the training systems and change certain policies.

It is the strategy underlying the threads that lead from the micro to the macro and back - acting locally ... thinking globally - that has lent its title to this preamble.

Acting locally... Andes has succeeded in corroborating, strikingly, what Pierre Calame (2) has to say :

- it is not in laboratories, nor in university lecture halls, that students may achieve an understanding of the health, food and dietary problems facing society, but through direct contact with the population ;

- health often depends more on the quality of food, diet and nutrition than on medication ;

- food, dietary and nutrition problems cannot be dealt with if the sphere of agronomy is excluded ;

- collaboration between specialists in agronomy and health is essential to the success of any strategy aimed at overcoming food, dietary and nutrition problems ; this collaboration must exist at all levels, be it in universities or in day-to-day work with the population involved ;

- on the nutrition level, when combating micronutrient deficiencies, it is preferable to influence production systems and the ways in which food is stored, processed and prepared, rather than to resort to the administration of pills and syrups ;

- extending loans to small rural producers is legitimate, so that they may stock their produce and sell it at a higher price at the right time, instead of giving it away immediately following harvesting, at ridiculous prices, to middlemen seeking their own greatest profit ;

- adequate dietary and hygiene practices should be an integral part of school programmes ; the educational sector needs support if it is to transmit knowledge to children, and help them to acquire proper behaviour in these fields ;

- health must be viewed at the family level rather than at the individual level : family health files make for a more effective health system.

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(1) Independent French journalist. Author of the book «La route des Andes». Paris : éditions Syros, 1993.

(2) Pierre Calame, a French engineer, head of the Fondation pour le Progrès de l'Homme and author of the prologue to «Former pour transformer» (Masse-Raimbault A.M., Guiheneuf P.Y. Former pour transformer. Fondation pour le Progrès de l'Homme. Dossier pour un débat, 1996 ; 49).

Thinking globally... Andes has constructed and experimented models for :

- introducing an innovative approach to training systems ; these include the master's degree in Food, Diet and Nutrition, the multidisciplinary nature of which is most original ;

- setting up agencies for researching and propagating technological innovations and promoting relevant policy changes. The Centre for the Study of Appropriate Post-harvest Technology (Cetap) and the Centre for the Study of Food, Diet and Nutrition are in charge of this.

The implementation of new policies in the food, diet and nutrition sector, parallelling the generalization of innovations, is quite an art, which required :

- throwing bridges between traditionally «independent» disciplines such as agronomy and health ;

- rethinking disciplines with a different logic, encompassing the needs created by the concept of integration ;

- establishing interconnections between knowledge and skills from the different disciplines involved, so as to make the bio-socio-technical system, within which peasants and technicians are actors, comprehensible to all ;

- forming a shared language, so that the thinking and expression of each individual can be understood by all ;

- creating and maintaining links with the actors, and favouring the adhesion of the population to the changes inaugurated.

As Anne-Marie Masse-Raimbault (1) has so aptly put it, to achieve transformations, training is required (2), but it is essential that the reorientation of training be a part of the project to transform policy orientations.

This, from our viewpoint, is a long-term wager that could never have been won with rigid objectives to be attained on a strictly defined schedule. The precision with which the qualitative goal was attained depended both on the degree of accuracy with which the future political, economic and social situations were foreseen, and on the estimation of the impact that the training of new executive-level professionals would have on the modification of policies.

The Andes project made a wager ! It provided forceful, coherent support for the triptych composed of the master's degree in Food, Diet and Nutrition, the Cetap and the Centre for the Study of Food

---

(1) Doctor of Health and Nutrition Sciences, France. Author of the book «Former pour transformer», a critical contribution to the methodology developed by Andes.

(2) A cogent but untranslatable play on words : «former», meaning «to train», is required for «trans-formation».

and Nutrition, in order to make the generalization of the successful local experiments feasible, to give the necessary impetus to the transition from the micro to the macro. These agencies may have seemed purely secondary, but this was not the case. In fact, they tended to maintain the spirit of the project alive, to preserve its dynamism and ensure its continuity.

The spirit of Andes rests on several disciplines - agronomy, health and education - with the shared objective of strengthening professional interaction so as to improve the living conditions of the families involved.

The dynamics of the project are democratic : we work hand in hand with the population, and progress together in our effort towards development. The democratic basis and a pluridisciplinary working system guarantied the fruitful, ongoing continuity of the project. Eighteen new graduates - professionals in health or nutrition, food engineers and agricultural engineers - with master's degrees in Food, Diet and Nutrition constitute the first graduating class of a new kind of elite : their vision and mission, with a prime on integration, are axed on a process of changes in food and nutrition-related policy and technology within the various state-run, university and private agencies in Ecuador and other Latin American countries.

The die is cast.

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ANDES AND ITS OBJECTIVES*

THE BEGINNINGS

It took a relatively long time to design the Andes programme, since the development of the approach corresponded to a maturation process both for the handful of Ecuadorian officials attached to various agencies but united around some shared values and for the International Children's Centre (ICC). The ICC had been working with Ecuador since 1973-74 (see figure 1), organizing courses on mother and child health, usually at the request of the Ministry of Health or the Institute for Nutrition, and conducting several studies relative to health and nutrition policies. Ecuadorian physicians also participated in the ICC activities in Paris.

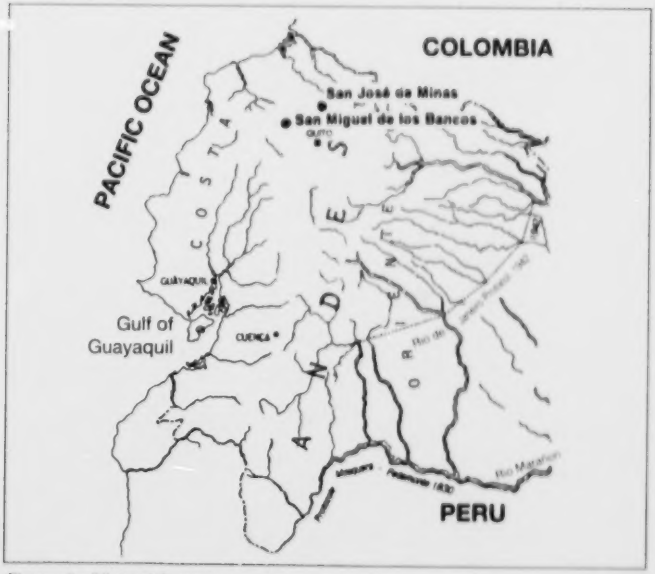

Figure 1 : Map of Ecuador

1984, bonds are formed

In 1984, a seminar on Ecuador's specific food, dietary and nutrition problems first brought together officials from the medical school and the Ministry of Health ; next, about 300 officials were informed of the dietary situation of the population of Ecuador, and rough drafts of some solutions were put forward, along with a working programme.

*** by Dr. Anne-Marie Masse-Raimbault, Dr. Michel Chauliac, Pascale Gerbouin-Rerolle (ICC)**

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1985

A research project on iron-deficiency nutritional anaemia took shape in 1985, through collaboration between the medical school and the ICC : it involved the establishment of reference figures for indicators of anaemia at different altitudes, a prevalence survey, the implementation of working protocols, the improvement of the facilities of the college's research laboratory and the training of researchers.

1986

It was in 1986 that the clarification process led to contacts with the college of agricultural sciences and that the two institutions, dealing with health and agronomy, jointly organized day conferences on the dietary and nutritional problems of the people of Ecuador, sharing their findings, their methodological and policy approaches and their vocabulary, and revealing the extent of needs.

1987

From 1987 on, this collaboration was gradually intensified : many Ecuadorian fellowship-holders came to France for internships supported by the French government, French specialists responded to the requests formulated by the Ecuadorian partners, etc. The 11th national congress of Ecuadorian physicians convened about 700 physicians for one week on the theme of «nutrition and public health». This event illustrates the current of thinking created in the country, and the interest in the subject shown by various sectors. Two books were published for this occasion, one on child growth and mother and child nutrition, the other on iron in the human diet.

The programme took shape when a team, already very closely knit, composed of officials from various disciplines, passed a turning point and adopted the following idea : the diet and nutrition of the population are fundamental aspects of a country's development, the Ecuadorian situation is not satisfactory, the orientations and action are far from conclusive. What should be done ? The Andes project was born.

What is Andes ?

What is the Andes project ? It is the name chosen by all of the institutions and officials who decided to pool their efforts and to use an innovative approach for work in the field of human diet and nutrition. Andes means «Alimentación, Nutrición y Desarrollo», or «food and diet, nutrition and development» in English (1).

A number of institutions participated in drafting, then in developing Andes, and especially the schools of medical and of agricultural sciences of the central university of Quito, the Juan César García Institute and the International Children's Centre, with support from the Fondation pour le Progrès de l'Homme (Charles Léopold Mayer Foundation-FHP-Paris). At the national and international levels, various agencies later made contributions.

(1) To simplify things, the term Andes will be used as a rule, in this text, rather than the Andes project, or the Andes programme. Interestingly, the expression «project» was used almost throughout the period during which the activities were developed, as if the people in charge were afraid to employ the term «programme» !

These included the college of philosophy (teaching department), the school of engineering (civil engineering department), the school of food industries in Ambato, the college of food industries in Massy (ENSIA, France), the National Conservatory of Arts and Crafts (CNAM, Paris), various international agencies such as the Pan American Health Organization (PHO), the Food and Agricultural Organization (FAO) and the group of Andean countries.

WHY ANDES ?

The evolution of «Diet-Nutrition» activities

Policies as well as activities related to nutrition went through a series of phases which we will attempt to summarize briefly here, to achieve a better overview of the reasons behind the establishment of the Andes project. For many years, in developing countries, the objectives of the health sector with respect to nutrition were the achievement of a better clinical and epidemiological understanding of the most frequent nutrition-related diseases such as protein energy malnutrition, the major vitamin deficiencies, goitre, anaemia and diabetes, along with a few activities providing nutrition education for mothers.

Nutrition-related diseases

Anthropological studies

There were education campaigns aimed at informing mothers of how to improve the diet of their children, and sometimes of the entire family. The boldest women actually admitted that they were already aware of these recommendations, but were not in a position to apply dietary recommendations of that type. Several anthropological studies on food and diet were conducted then, and were helpful to health workers and educators in designing more appropriate programmes. Focuses of these programmes included food products and cultural differences in how they are represented, dietary habits, taboos, rituals and practices, but they did not show how traditional eating habits were changing, or the interaction between the various material and sociocultural factors at work.

Nutritional status

Numerous cross-sectional surveys on the nutritional status of population groups were conducted, and programmes for monitoring child growth established, so as to collect data on their past nutritional history, and thus be able to develop preventive action that would be more appropriate and would begin as early as possible, and even to improve national food and diet policies.

Adolescent girls, women and mothers

Gradually, in the light of certain studies, it became clear that one major objective of public health programmes should be the nutritional status of women. Interventions affecting the nutritional status of adolescent girls, women of child-bearing age and mothers would perhaps generate effects that would be less costly and longer-lasting for the following generation. Such programmes would possibly be more effective than those that concentrated on complementary food for expectant mothers and small children (figure 2).

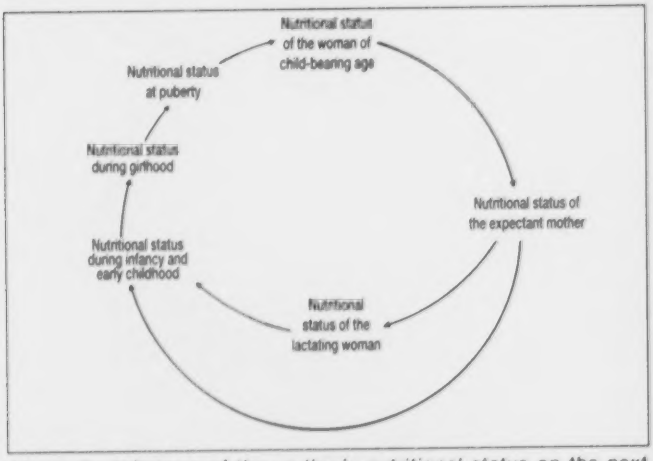
Nutritional status of the woman of child-bearing age
Nutritional status at puberty
Nutritional status during girlhood
Nutritional status during infancy and early childhood
Nutritional status of the expectant mother
Nutritional status of the lactating woman

Figure 2 : Influence of the mother's nutritional status on the next generation.

Household food consumption

At the same time, a few countries were launching surveys on the food consumption of households : these mostly quantitative surveys paved the way for studies of consumption patterns and others considering expenditures for food. At the national level, these studies were used to evaluate coverage of nutritional requirements according to food availability and to refine the bases of food policies. However, these extremely costly, cumbersome surveys were unable to estimate the effects of consumption on nutritional status, since they did not cover the same groups, as a rule. Once again, the major difficulty resided in the compartmentalization of the different sectors involved, and the absence of cooperation between them.

Some research teams then attempted to work in closer collaboration with the agricultural sector, so as to orient production towards a more appropriate response to people's dietary needs, rather than towards exportation only.

Each of these attempts, repeated in a number of contexts, fostered methodological changes in the ways of gaining knowledge about individual diet, a function essential to life, but the effort still turned out to be incomplete. The fact remains : it is difficult to estimate this dietary consumption, and its consequences on health status and nutrition, when the intention is to take into consideration all of the factors involved, and to go beyond the experimental, strictly biological approach - and even the nutrition-based approach, limited to what people eat - or a more economic approach based on the notions of income, prices and expenditures. While some researchers, and economists in particular, stressed the sociocultural dimension of food and diet,

analysis tended to remain quantitative, and therefore far from a qualitative, human approach which is more complex, comprehensive and subtle.

The Andes method

It is in this context that the Andes programme was designed : at first, the overall objective was to improve the living conditions and

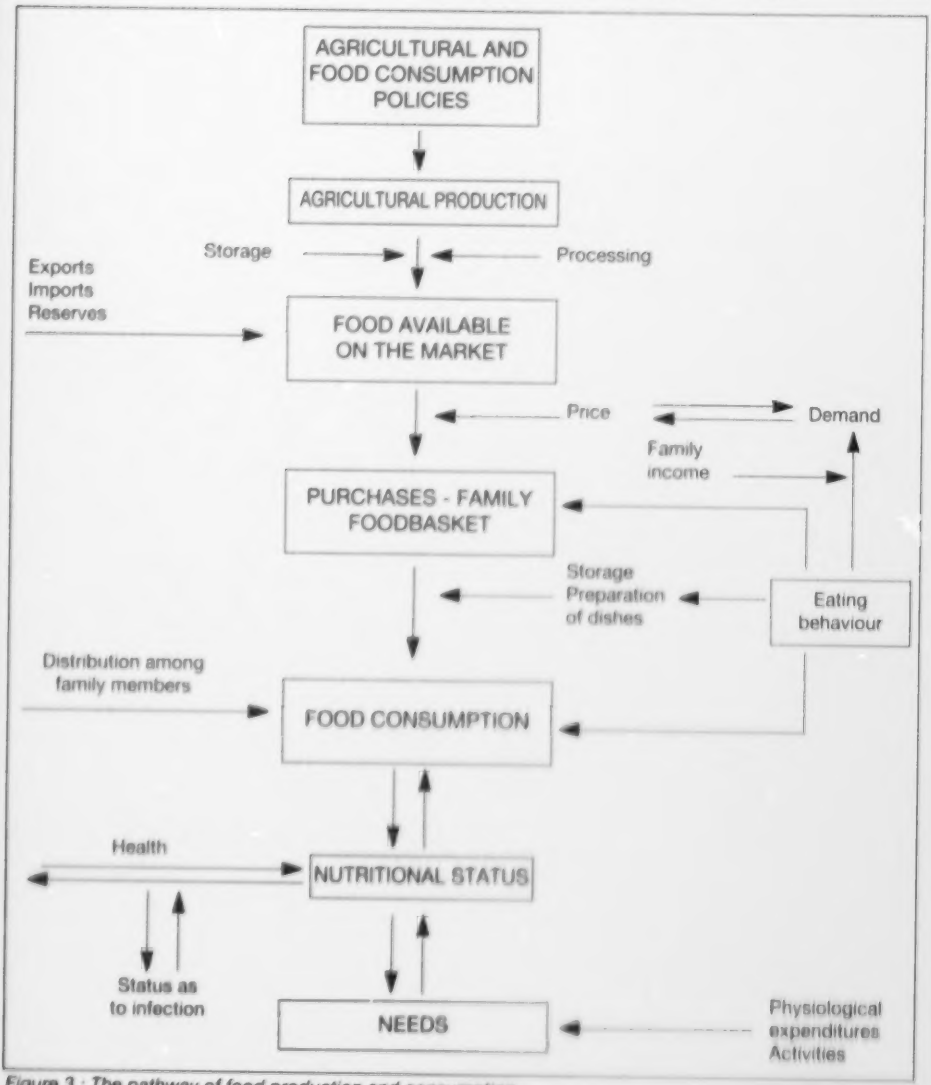

Figure 3 : The pathway of food production and consumption.

Andes in villages

... ministries

... colleges

diet of rural families. This may not seem terribly original : the innovative aspect resided more in the strategy chosen. One part of Andes was to develop at the grassroots level, in symbiosis with peasant families, while another part was in the colleges and the ministries. The purpose was to put students in contact with the everyday experience of the people with or for whom they would be working in the future, and to foster a decompartmentalization of colleges and ministries, through work in pluridisciplinary teams. The results attained in the field were to serve as a guide for changing the training programmes for present and future professionals, and to foster a better adaptation of some government programmes to the needs of the population.

The improvement of living conditions in a few villages was not an end in itself, then, but a means - through the results attained - of affecting training programmes for professionals and integrating innovative elements in the policies of the ministries concerned. This objective therefore led Andes to seek out the collaboration of the government and of the university, from the outset, and through this early sensitization, to gradually convince them of the relevance of certain proposals for change.

Fundamental values

Research

Action

Training

The methodology proposed was based on a three-sided «research/action/training» plan and on the apprenticeship of pluridisciplinarity in analysing problems and implementing action in response to these. A searchful spirit impelled all of the attempts ; it was out of the question to simply apply recipes learned elsewhere, the idea was to explore innovative trails responding to specific local situations. This working method was not confined to professionals, but was extended to the peasants as well. Once the problem and its causes had been identified, traditional knowledge and skills were to be compared with those brought in by professionals, to design alternative solutions. Their effectiveness and appropriateness could then be evaluated, so as to go on to spreading them. The goal was to familiarize peasants with the habit of seeking new solutions so that they would gradually become capable of improving their situation by themselves. From the outset, the connections between research, action and training were an essential dimension of the programme, both for the professionals themselves and for the peasants.

Pluridisciplinarity

The comprehensive approach to problems led directly to the experience of working in a pluridisciplinary framework. The peasants were of invaluable aid in this respect, since their demands were not particularly addressed to the agricultural or the health sector, they were of a more general nature, and were formulated in terms of everyday life. They therefore required that specialists analyse the problems in collaboration with the peasants, and that they look for solutions together, before going on to putting them into action : here, the degree of involvement of the various disciplines varies with the theme dealt with, but each specialty has a role to play, and intervenes at one point or another, and all follow the programme and participate in evaluation.

Peasant participation

Another pivotal point was peasant participation. This is a sine qua non element : it conditions the appropriation of results by families, their access to progress during the programme and especially afterwards, and also their ability to combat their fatalism and resignation to poverty. Moreover, the Andes team was ideologically united around the basic human values it wished to have accepted and applied, such as the respect of all human beings, their progress and freedom. The participation of the people in development programmes is a leitmotif found in the preamble to practically all projects, but to what extent is this attitude actually implemented ? Families experience difficulties in expressing their real needs, often they try to adapt their requests to what the field workers expect of them ; they are accustomed to being the target of programmes designed in their absence, rather than to formulate demands and to solve their problems through solutions that they themselves plan and apply with the support of technicians. The strategy here was not for professionals with a programme to implement to seek out the collaboration of the population, but, ultimately, for the people themselves to solicit the help of professionals once they have decided what activities they wish to develop. The objective, in eliciting peasant participation, was also to help communities to strengthen their social organization and to enable it to serve development programmes : families were to become decision-makers, actors and beneficiaries.

Programme flexibility

To obtain real peasant participation, a flexible programme had to be designed, one in which both the options and the content of the actions to be conducted, and the time required to complete them, would be flexible. For the institutional agencies, this meant a change of attitude and great trust in the initiators of the Andes programme. For the professionals who were to participate, the challenge was to agree to do without the security represented by concrete technical planning and scheduling of activities. What remained unknown was the type of demands that the peasants would formulate, their degree of participation and involvement, and the outcome of the negotiations with them. This does not mean that Andes leapt into this adventure with no programme or objectives, but the rules were different, and rested on some conditions regarding flexibility and respecting the tempo of local dynamics. Thanks to the adaptibility and comprehension of the officials from the technical and donor institutions, it was possible to work with the communities without offending them or pressing them, and without ever generating the usual feelings of being prisoners of rigidities and schedules.

A convention, containing the broad outline of the programme was signed by the deans of the colleges of medical and agricultural sciences, the FPH and the ICC for a period of three years, which was renewed ; the Andes programme extended over the period from 1988 to 1994.

Fields of action

Farm produce

Andes concentrated on those fields that would contribute to the improvement of the food, diet and living conditions of families. The activities, based on the demands of families, revolved around farm produce, health and education. The work on farming depended on

Food processing

Family income

Health

Education

the local ecology : Andes concentrated on the production of grain and on cattle-raising. The point was not simply to increase production, but also to consider this activity within a more comprehensive process, and to consider the grain storage phase at the family and community level, along with the sale of the crop, the improvement of pasture land, the conversion of milk into cheese and other dairy products, commercialization, etc. The focus being the improvement of family consumption, activities concentrating on family gardening and small animal-breeding were developed. While increasing family income was important for both the peasants and the officials, priority was consistently given to the nutritional status of families, and therefore to the diversification of diet through the consumption of locally produced food, promoted by educational programmes. In the health sector, aside from the curative aspect, Andes was particularly concerned with the organization of the system, and with the need for a truly preventive and educational attitude among professionals working in close contact with the population, and the use of a different approach. In the educational system, efforts were focused on the participation of elementary schools in the development process undertaken by communities, and on educating peasants through the activities. Bringing water to the villages involved in Andes brought on major changes in various aspects of family life, afforded an opportunity to practice broad, intensive pluridisciplinarity and considerably reinforced social organization in these communities.

The Andes programme took place in the districts of San José de Minas and San Miguel de los Bancos, both located in the Province of Pichincha and selected in collaboration with the ministry of health. The province is part of the area covered by the Quito medical school. Andes was therefore able to work with the personnel of the health centres, the educational and student teams of the university, from the outset.

The villages

San José

San José is a typical village of the Ecuadorian sierra, located at an altitude between 1,800 and 2,500 metres, with a population of 2,500. Eighteen communities are scattered around this area, and five of these, with around 860 inhabitants, were included in the Andes programme (figure 4). The population, composed of Caras Indians and mestizos, has been living in this region for centuries : families, composed of 5 or 6 people, mostly grow maize(1) for home consumption and for sale and some tubers and beans. They raise a few chickens, pigs and guinea pigs, which are fed on the by-products of crops and eaten mostly on festive occasions, thus varying their otherwise extremely monotonous diet, composed of maize, potatoes and beans. This is an extremely poor area, and 52 % of families cultivate less than 2.5 acres of often very steeply sloping ground, so that families rarely produce enough food to cover their own needs. To survive, members try to find paid work elsewhere. The houses are quite rudimentary, often composed of a single room inhabited by some animals as well ; the floor is hard-packed mud. There is no electricity or sanitation, and families fetch their water from the nearest stream. It takes anywhere from 1 to 2 hours to walk to San José, where the health centre is located, and the paths are hardly suitable for use by any vehicle.

(1) What North Americans, and consequently many people throughout the Americas call "corn".

Figure 4 : Villages in the San José de Minas region.
NB : The names boxed in correspond to the Andes implantation.

San Miguel

The district of San Miguel differs enormously from San José, and was selected for that very reason. Located at an altitude between 1,300 and 1,700 metres, it has a warmer climate and receives more rain. The area was formerly forested, and was cleared between 1940 and 1970. It is inhabited by cross-breed peasants driven there by the drought that reigned in the southern part of the country. Three villages were chosen for the project, representing some 400 inhabitants (figure 5). Lumbering and dairy farming are the main activities here : the milk is collected by large firms, or turned into cheese locally. There is a serious land problem : 50 % of families do not own any land, whereas 5 % own over 250 acres, so that the men are forced to work as farm hands on the large farms. Most of the land is reserved for grazing, and some tubers are grown for home consumption. Families who have some land possess two or three cows, a few pigs and some poultry. The dietary staples are rice, manioc, sweet potatoes and maize, with some fruit from time to time : the diet is therefore both monotonous and poor in animal proteins. Latrines are shared by many families, most houses have electricity, and water comes from wells or from recovered run-off or rain water. The health centre is in San Miguel, and there are still transportation problems for getting there. An important event occurred in the course of the programme : a major highway was built by the government, linking Quito with the Pacific coast. During the construction the situation was quite difficult, since the villages were more isolated than ever. Some positive aspects are

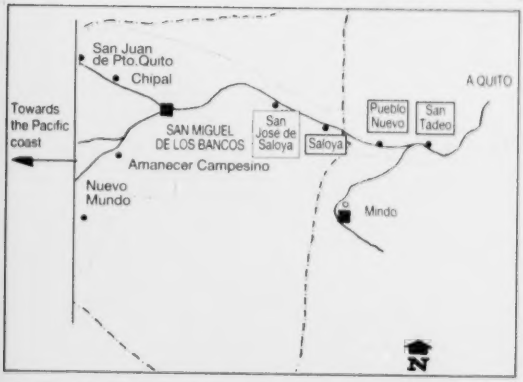

Figure 5 : Villages in the San Miguel de los Bancos region.
NB : The names boxed in correspond to Andes implantation.

now coming to light, however, and particularly the facilitation of transportation and the commercialization of goods, etc., but it is clear that these changes have disturbed an already precarious equilibrium, and it is difficult, for the moment, to determine the consequences of the construction of this highway.

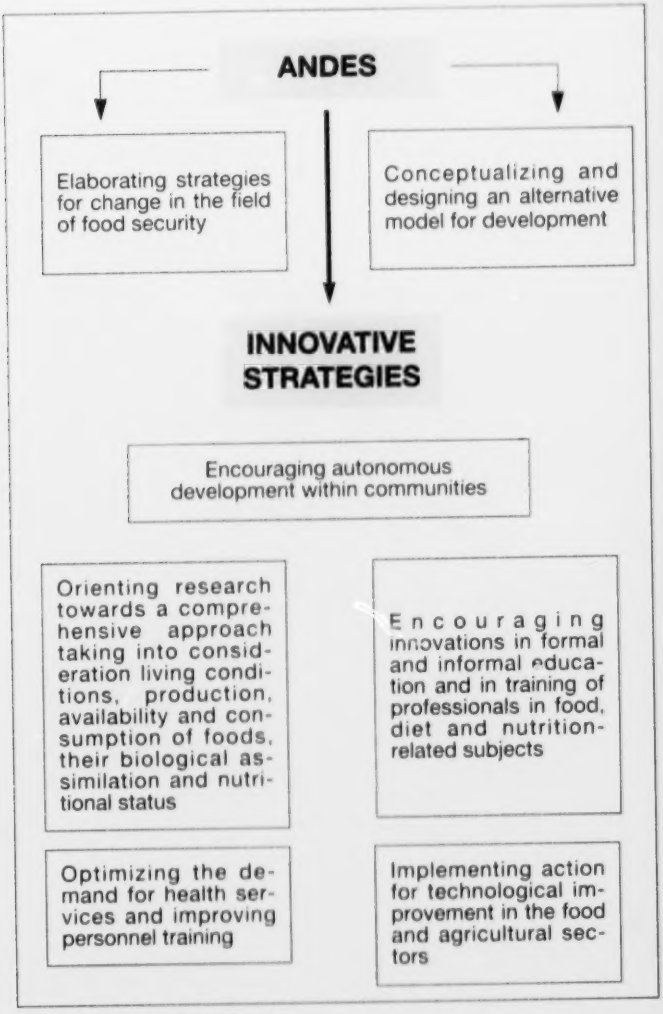
ANDES
Elaborating strategies for change in the field of food security
Conceptualizing and designing an alternative model for development
INNOVATIVE STRATEGIES
Encouraging autonomous development within communities
Orienting research towards a comprehensive approach taking into consideration living conditions, production, availability and consumption of foods, their biological assimilation and nutritional status
Encouraging innovations in formal and informal education and in training of professionals in food, diet and nutrition-related subjects
Optimizing the demand for health services and improving personnel training
Implementing action for technological improvement in the food and agricultural sectors

Figure 6 : Axes of Andes' work.

DIAGNOSIS IN A COMMUNITY-BASED APPROACH*

«Community study» and «community diagnosis» are commonly used terms, but often they cover a wide range of methods and techniques. Following attempts to apply health and development programmes defined at the national or even international level and only minimally taking specific local situations into consideration, many officials became concerned with adapting them more closely to epidemiological facts. In fact, people were coming to the realization that when a project is artificially injected into an area by an outside agency, it is doomed to failure, and that the absolute necessity of being familiar with the setting before implementing any action was a reality. Gradually, knowledge about communities was extended from their health status to living conditions, and finally to the consideration of some of the people's own demands. Andes decided to push this method further, and took up the challenge of referring to diagnosis in the community approach; that is, the active participation of communities in the attempt to comprehend their own experience.

SOME DEFINITIONS

In the Andes programme, officials often referred to the notion of change, viewed as different from intervention. Intervention suggests action planned by professionals, in which priority is given to the knowledge and tools wielded by professionals, and paying little attention to the knowledge, methods, values, beliefs and skills of the people concerned.

To simplify matters, we may divide attitudes into two sorts. The first is formalist, and proposes development models conceived elsewhere and applied to the implementation of action, in the hopes that the population will accept the proposed programme. The second, more pragmatic attitude, prefers those methods that enable people to express their own sometimes latent and poorly formulated needs, and to design solutions in response to their problems, a process in which they are accompanied by professionals. The people in charge of Andes chose the latter attitude, for these are truly contrasting attitudes. This does not mean that the Andes team came to the job with no concrete framework or concern with management. It too had a proposition to make to the various population groups, but what it had to offer was not a predefined, planned-out programme : rather, it offered overall objectives, some philosophical options, competences, attitudes and values, and a number of notions about management. In short, Andes proposed to «help» the population groups to identify those problems inherent in their living conditions and dietary system, to establish a hierarchy, to diagnose the reasons behind these situations, and, together with the people themselves, to develop action for improvement, and to put it into practice, in accordance with the available resources.

*** by Dr. Anne-Marie Masse-Raimbault, Dr. Michel Chauliac and Pascale Gerbouin-Rerolle (ICC)**

Collective participation

This meant that if change was to occur in the fields of health, education or production, and above all, if it was to persist, it had to rest conclusively on collective participation. Special attention therefore had to be paid to the team's first steps within the communities, and to how actions were begun. If living conditions and lifestyles are to change, the main actors - that is, the population, which has a perception of its own situation - must learn to express that perception, to broaden and deepen it by comparing it to what the professionals perceive, and it must also be prepared to visualize improvement and to organize itself to develop the necessary action and provide follow-up. At the outset, it is preferable to avoid overly ambitious or lengthy undertakings : the goals should be easy to achieve, and present a great probability of success, since this is how mutual confidence is established. These initial projects will serve as a basis for more ambitious undertakings.

Helping people to observe their life

Often we have used terms such as «helping people to observe how they live», so that they may achieve the distance required to define what changes are indispensable if certain aspects of their everyday life are to be improved. The point was no longer to get people to participate in projects designed by officials sitting in offices, but to produce and test approaches through which families might accomplish the work of analysing and achieving comprehension of the real situation, with the help of professionals, and implement action.

The process of change is more dynamic when the actors - that is, the inhabitants themselves - are a party to it, and are directly involved from the outset. In any attempt to act with the population, with its cultural system and not alongside or against it, if the main concern is for achievements to be sustained and the social organization reinforced, the direct protagonists of the change must learn to understand their way of life and to diagnose the bottlenecks, so as to correct them. This process is fundamental to the Andes programme, so as to define the point of departure, express the expected changes, plan action and define the goals to be reached along the way, and the point of arrival of the programme. But there is not just one step along this path : there are successive phases ; we might almost speak of an ongoing mechanism during which the inhabitants mentally evaluate the changes, prepare for them and domesticate the future action. This is what the Andes method expects of that process.

To achieve this diagnosis on a day-to-day basis, the officials used a great many tools and analytic frames repeatedly tested in various projects, and which will not be described here in detail. These methods yield an approach to all aspects of people's lives : the historical aspects, family size and composition, demographic, health, nutrition and education-related data, the family's economic resources (land tenure, manpower), nature of

goods produced, cultural systems, habitat, surveys of family food consumption and distribution of food within the family, etc. The conventional survey method used for diagnosis, also used by Andes at the beginning, should not be totally rejected, but it does have its limits. These questions often induce incidental responses. For whom are these diagnoses destined ? If it is the population, to what extent will it understand all of these figures and their use ? Aren't they, rather, a series of tools enabling the professionals to describe the situation, first within their own team, and later to their hierarchical superiors and/or sponsors, including the perceptions of the various disciplines, and then to possess reference points, initial data for use in evaluation ? No, they are more than that.

These findings, seriously enriched and humanized through the contributions of the communities themselves must at least partly serve the latter, inasmuch as the professionals are capable of simplifying the information without distorting it, making it accessible and usable, and presenting it to the protagonists through appropriate methods and at the right time (that is, providing proper feedback). What must be developed in the families is a slow process of gradually learning how to understand, analyse and interpret this information, often given in quantitative form. While this process enables families to gain a broader, more concise perception of their way of life, professionals too will learn other things in contact with them, and will therefore complete their own knowledge. This mutual enrichment touches on the everyday life of communities, but also the system governing the relations between all of the individuals involved, be they the inhabitants or the professionals.

We would emphasize three points on which Andes focused its efforts : community diagnosis as an ongoing process, the socialization of the data collected and of the network of human relations, and last, the development of certain attitudes in professionals.

DIAGNOSIS, AN ONGOING COMMUNITY PROCESS

An ongoing process

In the community-based approach, diagnosis is an ongoing process. This postulate, derived from previous experience, was laid down from the very beginnings of Andes. What counted was of course not the viewpoint of the experts only - as is so often the case in diagnostic action - but what the villagers said and thought, their ways of visualizing the problem under discussion, so as to apprehend the nature of the difficulties, along with the capabilities of each individual and what resources the milieu had to offer ; in this way, by comparing the contributions of the population and the findings of the studies and observations of the professionals, the ways in which all parties analysed the situation, a description might be obtained that would be closer to reality, and the beginnings of solutions might germ. If disagreements arise on any one problem or priority, a discussion and negotiation phase is entered : if it is conducted well, it may be a learning experience, furthering progress.

Successive diagnoses

This diagnosis was never confined to the first phase of the programme : the concern with the pursuit of knowledge never waned, it remained a constant preoccupation throughout the operations, and at all times. There was no one diagnosis, but recurrent diagnoses, occurring successively all along the programme. Diagnosis is like a tapestry which one gradually completes and enriches. Sensitive observation and continual listening is one of the key attitudes if one is to perceive the demands of peasant communities, understand their reactions to change, their resistance and their evolution, and enable them to situate themselves in their own history. It should be remembered that it is often not an easy thing for peasants to formulate demands or give opinions, especially when their horizon practically stops at their village, and they have few points of comparison and sources of stimulation : they simply cannot imagine that things can change.

At the beginning of Andes, the people in charge of the project did bibliographic research to take advantage of all previous studies in the health, agricultural and cultural fields dealing with the Andes villages ; they met with the people who had worked in the region, so as to hear about their experience and receive their advice. This information was consistently reported back to the piloting meetings, so that the profile of the population groups might gradually be filled in, on the basis of the approaches of various specialties. This also yielded an opportunity for the professionals to harmonize their vocabulary and to begin to familiarize themselves with pluridisciplinarity, thus completing their personal approach and creating the Andes team.

Home visits

At the same time, in the various areas, meetings attended by the heads of the institutions involved (health centres, elementary and secondary schools, political and administrative agencies, etc.) and villagers were being organized, prompted by the professionals and actively supported by the teachers. At this point, the family counts also began : there were home visits to each family, once an appointment had been set by the teacher, often on Saturday or Sunday, days of rest when the entire family was present. This meant going from house to house, to get to know the adults and children, establish an exchange, explain the objectives of Andes, observe the living conditions and health situation, and take the first steps toward a trustful relationship. Home visits (1) played a very important role, since they were a perfect opportunity for personal contact, in which everyone may express him or herself, rather than the men only, or the leaders, who have less difficulty in speaking. It is also easier to broach delicate, intimate subjects there. These visits are an indispensable complement to meetings.

Surveys were also under way, and they gradually yielded quantitative information on some aspects of health, education and agricultural production.

(1) See «Children in the Tropics» : Home visits, by J-F Bouville. N° 212, 1994.

Through this work the bases of diagnosis were established. But in-depth understanding, more difficult to delimit, including the cultural aspects, the networks and systems of social and interpersonal organization, was pursued in the many village meetings, health consultations in villages, during work in the fields, parents' meetings in schools, innumerable home visits and informal encounters. Confidence and mutual enrichment was greatly enhanced by the professionals' participation in the «mingas» (1) and festivities, not to mention all of the shared meals.

Respecting the peasants' sense of time

The Andes programme was a process of enmeshed diagnoses and action, generally articulated together and overlapping. This ongoing community diagnosis served to enrich the programme throughout its history, to gradually increase the awareness of all of the people involved, and to give the same opportunities to all. Some families were slower, others less easy to reach, while still others, more timid, did not dare to break away although they were actually not ready to participate. It is absolutely necessary that all receive the same information and be able to decide freely. Implicit in this diagnosis method is a notion, difficult to apply, and which is «time» : respecting the peasants' sense of time, leaving them the time they need to gain awareness, to dialogue, think, mature and learn.

The memory of information

Keeping a memory of information turned out to be a difficult operation. The point was not to write innumerable reports, but to be in a position to afford responses, through programmes adapted to the needs of families. Furthermore, it was discovered that most of the findings collected during this ongoing diagnosis (the family health dossier, the health surveys, data on farming, etc.) should be kept for the management of the programme and the analysis of the development process. Documents were therefore written, diffused and some were even published. The pilot team used these documents as a point of departure for evaluation and feedback, and in their dossiers for the national authorities and sponsors. Also, when any new professionals arrived in the area - a frequent occurrence, since the personnel was highly mobile - the documents were used to inform them about village life, thus avoiding the repetition of surveys that had already been done. This would not only have been a waste of time, but would also have indicated a lack of respect for the population. It was preferable for the newcomers to become full-fledged participants in Andes by using their first contact with families to

(1) The minga, an expression of the peasant and indigenous community, is a still very lively traditional activity. It consists of convening the community's entire work force for the achievement of actions such as making a path, building a school, a church or a house, or even participating in harvesting. Meals, prepared by the women, are taken in common during the hours or days of this collectively decided work.

broach a subject that had not hitherto been explored in depth. For the population, these findings were useful during the information-sharing meetings and also when they learned evaluation techniques or economics.

Diaries

While the establishment of reports on findings had not been viewed as a goal in itself but rather as necessary for the development of a satisfactory working tool for the future, it did seem important and valuable to avoid losing or forgetting the ideas, thought processes and mode of action of the Andes workers. Each individual was therefore asked to collect his or her day-to-day reactions in a sort of diary. Although everyone was convinced that such information was extremely rich, the fact remained that writing a diary is a demanding task, especially for field workers living in conditions that were often not conducive to writing. Moreover, it was later discovered that some of the people in charge had actually kept a diary but did not wish to have its contents publicized, since it contained personal and ideological comments. It would have been preferable to plan and structure the diaries and their use in advance, and above all, to work out a way to pool them so that everyone might profit from the day-to-day notes while protecting the anonymity of their authors. We are all aware of how difficult it is to make the most of this type of document, and how many hours this requires, but we remain persuaded that when properly managed, this work is extremely valuable.

THE SOCIALIZATION OF INFORMATION

These phases, known as «the socialization of information», which we have mentioned briefly above, are pivotal in the mechanics of popular participation, but also in the participation of the pilot team. The results of diagnosis, both quantitative and qualitative, were the object of sharing and discussion, not only between the population and the Andes pilot team, composed of professionals working at the grassroots level and in universities, but also within the pilot team itself.

Giving people complementary information on their situation with respect to production and health status (such as data on iron deficiency, explaining the causes and consequences of their nutritional status), is useful for testing the validity of studies, and achieving understanding of the people's own perception and interpretation of the particular phenomenon. This then makes it possible to work with the community in thinking about appropriate action such as a modification of the production and consumption of certain products, the development of lemon-tree growing so as to revive the custom of drinking lemon juice-based beverages which enhance iron uptake, etc. Following the study of farm production and the many complaints expressed by peasants about diseases affecting maize, solutions were looked for together, ranging from improved seed to the establishment of family silos. During these general assemblies, with their sharing of information, mutual enrichment and negotiations, the action to be undertaken in order to solve these problems gradually took shape, and bonds

of trust and recognition of complementary competences were woven.

Sharing information

Meetings for information-sharing attended by people in charge of different sectors within the pilot team were also rich and important for the pluridisciplinary approach. Did a problem revealed by the farming sector, such as the insufficient maize production, concern the health sector ? Yes, since it affected family maize consumption and therefore nutritional status : action would therefore involve agronomists as well as health professionals, but also the education sector, which would broach the subject at school in the form of applied education (acquisition of knowledge and skills by schoolchildren). Before it shared its information with the village communities, the Andes team had already worked at putting information together at its own level, so that the findings accumulated by different workers could be shared, and a comprehensive although still incomplete approach to the situation achieved. The aim was to come as close as possible to reality, to abandon the cloistered approach characteristic of each specialty, and which is so different from what peasants encounter in their everyday life.

The grapevine

Another mechanism for spreading information, frequently used by the peasants in the programme, was transmission by word of mouth, known as the «grapevine». The term was not used to mean gossiping or malevolent chatter, it did not have a negative connotation : this informal mode of communication helped to spread a great deal of news, and fostered changes of mentality.

ATTITUDES DURING DIAGNOSIS

The importance of listening and tolerance

The restitution of the different viewpoints, a phase during which information is validated and socialized, is the fruit of fundamental attitudes in work with communities. Indeed, people must completely assimilate the information accumulated by the specialists, and do so by adapting and completing it and reintegrating it in their own vision : this is essential. This approach means that families, in turn, may express their reactions, disagreements, wishes and ways of thinking and acting.The pilot team must therefore be capable of listening, getting people to speak, establishing a dialogue without being afraid of silences, conducting meetings in which people all feel at ease and are able to express their way of viewing events, however clumsily. It takes enormous time and patience to listen, to refrain from deciding in people's stead, from doing things oneself instead of letting other people do them, under the pretext of efficiency and a strict timetable ! But prolonged contact with the population, and sharing of its life is required to achieve this. Workers must often remind themselves that the objective is not for the operation to succeed within a given lapse of time, but that the community advance towards its autonomy, that people be trained and ties based on solidarity be consolidated. All this is not really learned during university studies !

Respecting others

Respect for others and their way of life and of thinking clearly turned out to be an essential notion : there are not two categories, with people who know and others who are ignorant. Everyone has knowledge, but of different kinds. Similarly, the values to which professionals refer are not necessarily the «right» ones. What is important is above all to understand others and not be judgemental.

From the outset, the expectations of each of the partners must be clearly expressed. There is no place here for the «black box pattern», that is, situations in which access to key information is refused to certain users. The notion of the transparence of objectives is essential.

Being capable of observing

Another attitude that is difficult to develop without the proper bases is a sense of observation : the ability to look, store information, memorize it, put facts together and class them. Last, one must consent to compare them with others, and to check on their value.

While methodology was a major issue in Andes, the behaviour of the professionals played at least an equally important role. The fact of being a doctor, agronomist or teacher did not mean that the person had any special power, and that his/her relations with the population would provide means of wielding and reinforcing it. To dialogue with peasants on an equal footing, in an authentic relationship, professionals must accept to step down from the pedestal on which their university diplomas tend to place them, and discover other ways of relating. Recognition of social status is not based on titles but on effectiveness, competence and some human values. An agronomist or a physician can make mistakes, or simply not know the answer : it is not always easy to accept the need to call oneself into question, to see one's scientific knowledge questioned, and to confront one's often bookish experience with the experience of peasants. When peasants reject some action and its funding on the basis of valid arguments, isn't that a positive indication that they have succeeded in achieving autonomy ?

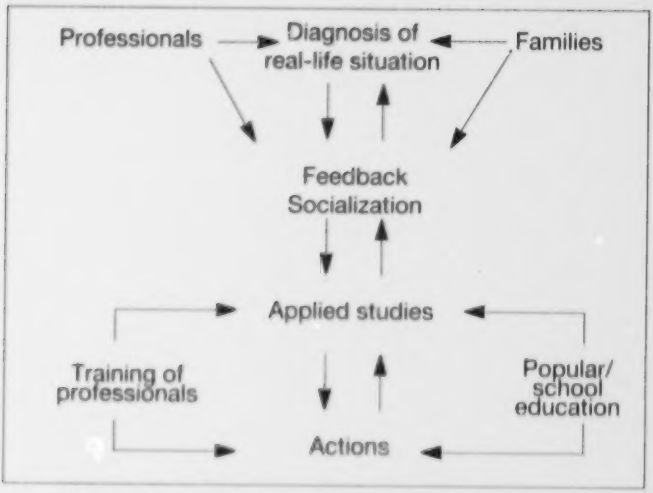

Figure 7 : Diagnosis of real-life situations and Andes.

Work in the field is grounded in analysis of the experience, the daily life and demands of the population, which analysis is done by the families with the help of professionals.

Applied studies improve the knowledge and competence of peasants - while respecting their own experience - and of professionals.

The information collected as the programme goes along is socialized, so that people may analyse it, sort out the facts and enrich them, and last, integrate them in their own heritage. Plans for action take these qualitative and quantitative data as a starting point and are integrated in the knowledge and skills of the peasant partners, but also in training programmes for today's and tomorrow's professionals.

Andes does not confine its goals to the achievement of popular participation in the improvement of living conditions, it also affords a structure and a type of dynamism, so that people may consolidate their social organization, regain confidence in themselves and engage in self-management in order to progress.

BEST COPY AVAILABLE

MAIZE : FATHER AND MOTHER*

THE SITUATION

In the San José de Minas region, maize(1) is the core crop around which the economy and life of both family and community is structured. Work neither begins nor ends on a peasant's own property, it begins and ends in the area as a whole. San José is a maize-growing sector par excellence, with an extremely rich history containing many elements that reveal the complexity of Andean civilization through one of its key values : maize-growing. This is helpful in understanding why the peasants have such great respect for their natural surroundings, love the land they live on and love maize as well. To speak of peasant life, then, is to speak about maize-growing, and to speak of food and diet in these communities is to speak of maize. To broach the problems encountered by families means, above all, to deal with the post-harvesting diseases affecting maize.

The San José region is located on the slopes of the Andes cordillera, and the fields, at altitudes between 1,500 and 3,500 metres, are very steeply sloping : 48 % of the land cannot be cultivated, and the rest suffers from severe erosion. The annual figure for rainfall is about 1,350 mm, concentrated between the months of October and June. The average temperature is about 16°C, but there are great fluctuations.

The production units are usually small : about 80 % of them cover less than 12.5 acres, including many with less than 2.5 acres, and the remainder never exceed 75 acres. 54 % of the tillable land is devoted to maize, with sweet maize for (personal) human consumption grown on the smallest farms and hard maize, sold to the poultry industry, grown on the larger farms.

A few other crops such as white carrots (arracacha xanthorriza), camotes (ipomaca batatas), as well as the peas and beans that are grown in association with maize, complete the diet of these peasant families. Some home gardens offer cabbage, onions and occasional fruit trees yielding taxo (passiflora mollissima), granadilla (passiflora quadrangularis) and tree tomatoes (cyphomandra betacea) ; very few families have avocado trees. Before the onset of the Andes programme, a few lemon trees could be found in the area, since lemon juice-based drinks were frequently consumed ; this waning tradition has been revived and encouraged, for the vitamin C contained in citrus fruit favours the absorption of iron and thus helps to prevent iron deficiency, highly prevalent in the area. Lemon trees have been planted around schools and homes in the Andes programme area. The popularity of the lemon drink has increased, thanks to the greater availability of lemons and an educational programme encouraging their consumption.

*** by Eduardo Espín, agricultural engineer, and Eduardo Cañar, agricultural engineer (Andes team)**

(1) See note page 16.

An intense social life...

The population of the San José region is composed of mestizos in some villages, native Otavalos (1) in others, all settled there long ago. The economy of these extremely poor communities is based on farming of small plots of land. The close family relations and extremely strong ties within the community, especially among the natives, are the keystone of their way of life, its economics and its politics. Relations with nature tend to be more tied to their economy for the mestizos, whereas they tend to be of a more spiritual nature for the natives, whose intrinsic conception of life is expressed through nature. Although all of the peasants are familiar with the land, the earth, rain, wind, plants and animals, their meaning and influence on human life are different for mestizos and for natives.

with profound values of mutuality and redistribution

The only relations these communities entertain with the outside world involve buying and selling, and these disadvantage them on two counts : first, the financial balance is negative, and secondly, the members of the community gradually lose control of decision-making. As a result, the peasants are increasingly impoverished and the community ties have broken down to some extent, although the patterns and strategies of family, communal and cultural subsistence do persist. This is true of mutuality and redistribution.

The community organization does not correspond to the organizational criteria of the modern world : it is a social phenomenon involving action and behaviour that remain implicit for us. It is an integral part of everyday life, and is evidenced during festivities, activities done on behalf of the community and in the concept of solidarity embodied in mutuality during some kinds of work and very often in maize-growing.

MAIZE-GROWING

Growing maize is not a simple process involving entering inputs and retrieving products : it is a complex phenomenon closely connected with all of family and community life. It is a combination of two dynamics, one natural, the other social, the interactions of which have generated the development of knowledge and skills yielding profits corresponding to human and social needs. All of these elements must be considered when looking at maize-growing.

The land

The land is the basic productive element. The fact of disposing of it at the family level gives a man peasant status. While the land is a part of nature, its distribution and property are determined by social dynamics. Land enables peasants to be a part of nature, and this explains their passionate love for it.

Rain

Wherever farming is rhythmed by the seasons, rain determines the year-round cycles of activity. For these communities, the year begins with the first rainfall and the growing cycle is absolutely synchronous with the rain.

(1) In Latin America, the term native is often used to designate various groups of Indians, with no pejorative connotation.

The sun	Sunlight and heat directly influence the internal processes of the cycles of living beings. This influence explains why earlier generations worshipped the sun.
The moon	The moon also exerts an influence. During the farming year, the peasants decide the dates for certain tasks on the basis of the lunar calendar. The moon's halo is known to affect the photoperiodicity of plants and the reproductive behaviour of some animals.
The wind	The wind may be useful and desired during the harvest period, for some crops, but it is also feared during the growth of certain plants.
Scourges	When scourges occur too often - that is, when their incidence causes more than the usual amount of damage - they are viewed as god-sent punishment. The losses suffered are generally inflicted by insects, either during the growing season or during storage.
Weeds	While weeds are viewed as a nuisance at the beginning of the growing season, this is no longer the case once the crop has reached a certain critical point, and after it has been cut ; they then become useful as fodder for animal-raising. Some weeds are of medicinal value.
Tools	Most of the tools are designed, made and adjusted by the peasants to correspond to their needs, and with an eye to maximum efficiency. These tools are quite simple and do not require any financial investment.
Seed	Seed is needed for the reproduction of the species, and fosters synchronism between the social dynamic and the climate (the natural dynamic). They supply feedback for the productive process, and represent one of the links in the chain of production, over time. For peasants, seed is specially important.
Work	Human energy is the catalyser of interactions between the social dynamics and the natural dynamic. This energy, expressed by both physical labour and creative thinking, results in the production of the means of subsistence, at the family level, and of mutuality at the collective level.
Social organization	In the field of production, where maize-growing is concerned, social organization takes the form of mutual aid, unpaid collective work and mutuality in relations. These activities then constitute a social event, in which participants have the opportunity to meet and to share work, food and drink. This is experienced in complete harmony, in time and space, within a productive process.
Capital	Capital constitutes the means of financing inputs and labour, so as to develop and increase production ; only a few productive units possess any capital, and are able to sell part of their crops on the marketplace.

In the area as a whole, maize-growing supports the entire economy. However, there is one logic for growing sweet maize

and another for hard maize, with no conflict between the two. The logic of subsistence farming and home consumption includes the production of various plants and animals and the sale of one's manpower. This logic revolves around growing sweet maize, applies techniques that exclude any recourse to capital or money, and remains in harmony with the social and natural dynamics.

The business logic revolves around a single crop, hard maize, and adopts techniques requiring capital to generate high yields and profit.

Mutuality, mutual aid and solidarity

Maize-growing requires manpower throughout the cycle, for there is work to be done over a short period at each stage of growth. If all of the work were to be done by single families, they would be unable to do it all in the necessary time lapse : any recourse to outside, paid manpower would be too expensive for small farmers. This is why mutuality remains the key to farming, at this level. These two totally distinct logics revolve around the phenomenon of the buying and selling of labour. Although within the logic of subsistence, the sale of one's manpower is a strategy aimed at completing a meagre income, the business logic of purchasing labour becomes a necessity if the production process is to be impelled. The growing of these two varieties of maize within this area therefore does not represent the addition of two separate family production processes, but rather, it generates broader relations which lend shape and dynamism to the whole, break through the framework of the micro-economy to reach the macro-economy, and give it a social character. This becomes a phenomenon rooted in the relationship between the quantity and the quality of the land possessed, on the one hand, and maize, the object of the work, on the other.

Maize

It took a long time for the earlier generations to develop and adapt varieties of maize suitable for growth in the various Andean regions, with their specific microclimates. Rainfall and temperature are essential, decisive elements in the cycle of these varieties of maize - known as annual maize - in the Andes.

After sowing, the seed sprouts within one week. In 75 % of cases, the male flower develops towards the 112th day and the female flower appears 2 weeks later. By the 166th day, the grains of maize are formed and are already big enough to be eaten green (as «choclo») ; this choclo maize lasts for 30 to 40 days, as it continues to ripen. At about 249 days, the maize has attained physiological maturity and the cycle is completed. Harvesting takes place between the 260th and the 290th days.

People who grow maize rightly claim that it is everything to them : it occupies them constantly and they eat it all their life.

CULTIVATION

The preparations begin : they hark in the new year. The dry stalks are collected and burned by seasonal workers ; sun and wind are needed, then.

In september, it rains

In September, the first rain marks the onset of the new farming year, and with it, the preparation of the land. These activities take place during mingas, joyfully, with food and drink shared. Mingas are very important for the Indians, for whom they are a festive occasion, but much less so for the mestizos. This is a very active form of mutual aid and solidarity.

Sowing

In October, solidarity continues to animate mingas. The best seed is sowed in Mother Earth, enthusiastically, in accordance with the phases of the moon. Much love and skill goes into doing this. The most important person during this work is the woman : it is she who must sow, even if she has a baby on her back, or is nursing.

In November, the seed sprouts

In November, heavier rain alternates with very sunny periods. This is when the new maize crop vigorously spears the earth and begins to grow. The countryside turns green, and it is time to prepare the tools for the first weeding, with the help of the children, on vacation in December and January. There will be a second weeding and earthing-up of plants in January and February, and while people work elsewhere, they must still leave time to work on a small plot of sweet potatoes and white carrots, and to take the animals to distant grazing land, and sometimes to sell them at the market.

March, the parasites

There are usually some extremely windy periods in February and March, and sometimes the maize stalks are completely flattened. This is also the season when the aguacuro (macrodactylus) comes out. It does its greatest damage during the rainy season (in March and April) ; however, the extent of losses varies from year to year.

Young maize : «choclos»

In April, the presence of certain species of birds is a sign of the beginning of the choclos (young maize) period. It is a good sign, since the previous year's reserves are on the point of exhaustion. Families then have choclos, young beans and marrows to eat, and maize leaves for animal fodder. At the end of the choclo harvest, a small plot may be cleaned, on which to sow green peas and bush beans, in May, and to plant potatoes, if there is room for them. There are no mingas for these farming operations, they are done by individual families. Women and children normally participate, in addition to their everyday tasks.

«Chuchuca»

Then comes the preparation of chuchuca : cooked, dried choclo to be eaten later in the season. This is also a time for evaluating the future crop. For the natives, it is an opportunity to celebrate, to cook guinea pigs and chicken for Saint John's day and Saint Peter's day (the latter half of June), and to drink and dance, going from house to house, throughout the area, as they do during mingas.

July, harvesting

In July, those members of the family who had temporarily left to find work begin to return for the harvest. The dates of the latter depend on when sowing was done. Mingas are again organized, and women find opportunities to earn some money on those farms that hire workers to harvest the hard maize.

Hiring is done by visiting each family, and a glass of liqueur seals the agreement, or else the message is transmitted orally and the invitation to help the farmer is spread by word of mouth to the people who are susceptible of responding. In this way, the farmer is sure that everyone will be there, and that no-one else will do harvesting on the same day.

Just as for sowing, enthusiasm and joy pervade the community. This is an event, almost a festive occasion. Then, once the bustle of harvesting is over, the maize is sorted out in the homes, by the family or with the help of workers paid in coin or in maize, for the seed put aside for sowing must be separated from the maize for human or animal consumption. The villagers are then sure to have maize for eating, another part to be sold in order to pay debts or to satisfy some future needs.

Next, the stubble is collected for the draught animals, which must now be brought back from the far-off pasture land. Whether the crop was good or bad, maize is always abundant at this time of year. Productivity is rarely very high, and the peasants seem resigned to this situation. One of their fears is that the maize may have been contaminated, by a weevil (sitophilus sp) in particular, even before it was picked.

STORAGE

The maize is brought home, and must be sorted out before storage : parents, children and kith and kin separate the damaged ears from the healthy ones, and select the biggest, most regular ears for seed. At the same time, the loft located over the main room must be readied. There are always butterflies (sitotroga cerealella) flying around in them, and what is to be done if the maize is already contaminated by weevils, even before it is stored ? Malathion (an organophosphorus compound) is usually sprayed onto the maize at storage time, in this area, in the hopes of keeping it in good condition as long as possible.

Peasants are still worried, however, since the harm extends progressively, despite the treatment. They are obliged to eat the maize rapidly, and even to sell part of the crop, in some cases, to avoid excessive losses. At the egg and larval phase, the insects are not destroyed by malathion, and infestation may continue. Furthermore, insecticides are extremely toxic. This scourge affects both sweet and hard maize, and inflicts extensive losses.

CONSUMPTION

One frequently hears women say «maize is father and mother : that is why we love it like our parents». Why ? «Because if there is a shortage of maize, we have the feeling there is nothing to eat». In communities, when the conversation runs to food problems, it is maize that is the subject, for it is the staple food, even when white carrots and camote form an important part of the diet. Once stored, the ears of maize are eaten every day, in a variety of forms, either because there is nothing else to eat, or out of habit, or simply out of fear that disease will cause great losses, in which case consumption is increased.

Ways of preparing maize

Maize is generally available for eating between August and December. Depending on what they are eating, people choose ears with large grains to make «mote» and for roasting, whereas ears with smaller grains are ground into meal. «Mote» is eaten alone or mixed with beans or some other pulse. Meal is used to make cakes, coladas (bullion), different sorts of pasta and vermicelli, and «quimbolos». Women occasionally mix maize with sweet potatoes, white carrots or potatoes, or mix various sorts of maize. Over the months, these different preparations are made repeatedly, depending on how much dry maize is available, generally until December or January. Then, until March, larger amounts of other foods such as sweet potatoes and white carrots are eaten, but families may also borrow maize from those whose harvest was better, and offer work in exchange. Other food, essentially flour-based goods and pasta, are purchased to complete their diet.

In April, peasants eat the long-awaited green maize, or choclo, every day, either alone or with young beans, in soups, cakes, «humitas» (steamed dough), on the ear or shelled. In fact, the recipe is unimportant, what counts is to make the most of this period until the maize begins to ripen. At that point roasted maize, or chuchuca is made, to use the last choclo.

In June, the diet is composed of late choclos, ripe choclos, young beans, gourds, marrows, white carrots, sweet potatoes and other produce, as people await the new crop of maize, which is harvested in July and August.

Thus, the biological and social continuity of the family within the production unit is secured.

FORMULATING WHAT IS AT ISSUE

One of the main phases in the relations between peasants and specialists, within an intervention, is what the Andes programme has termed «formulating what is at issue». This is the most critical point, the moment when knowledge and experience knit together and take on a different character. Whence the importance of having previously approached peasant life, so as to understand its dynamics as objectively as possible. Formulating what is at issue is a phase involving dialogue and debate, then, and not a monologue.

Contamination

In the case of maize, the first important point was the identification of post-harvesting difficulties, followed by those that occur during the growing season. At the post-harvesting level, storage had always been, and remained, the critical element, for both sweet and hard maize. Lofts were used because peasants do not know any other storage system, and the loft is perhaps the only place that affords a degree of security... but the temperature right under the roof is ideal for insect infestation ! Malathion was applied throughout the area, in an attempt to solve this problem. This product reduces losses only slightly - by no more than 25 %. The fear of experiencing greater losses led peasants to eat more sweet maize, or to sell it earlier in the season, even if this meant taking a

50 % loss with respect to the peak price that might be obtained later.

Losses

The presence of the aguacuro when the female flower develops, in both sorts of maize, causes considerable losses. While the amount of damage done by this insect varies from year to year, farmers are nonetheless always worried about it. This is neither a permanent nor a general problem, in any event, and the losses incurred are not as heavy as those experienced during storage.

Since the objective of the Andes programme is to deal with food and dietary problems, priority had to be given to seeking out alternatives susceptible of solving consumption problems, at least partially.

A new variety of sweet maize

Work was then predicated on the possibility of introducing a new variety of sweet maize in the prevailing farming pattern. This early variety would avoid attacks by the aguacuro and make it possible to grow another crop with a short cycle in the course of the same year. The variety of maize selected was INIAP 131, whose vegetative cycle of 200 days could be followed by growth of green peas or bush beans (with a 90-day cycle). Trials turned out to be fruitless. The early species could not be introduced in places where an annual variety (hard maize), synchronized with the annual growing cycle, was habitually grown. Another negative factor was the fact that the variety tested requires fertile land, which is not the case of the steeply sloping, heavily eroded plots cultivated by these small farmers. Furthermore, the peasants are not ready to invest in seed for sweet maize, which is grown for home consumption.

This failure did not affect the original goal. Although early varieties of maize turned out to be inappropriate, it still remains both ethically and technically necessary to find solutions to increase the productivity and variety of produce, so as to improve food availability.

The loft + malathion combination does not solve the problem of storing sweet maize for home consumption. The life cycle of parasites led workers to look for alternatives that guarantee insect-proof storage and the total destruction of insects (at the egg, larval or adult stages), through the use of appropriate substances. By sharing ideas, the outcome of experiences and even failures of small trials, as well as by reviewing the literature, it was discovered that use of metal silos was not only a relevant solution, but was in fact an essential link between production and home consumption.

FROM MAIZE... TO THE FAMILY SILO

Protecting maize

To protect maize is to defend life and preserve local culture. The problem at hand, then, was to design a type of silo with a capacity corresponding to the average amount of maize eaten by a family, at a reasonable cost to the beneficiaries. Comparisons of the cost of raw materials led to the conclusion that the most economical solution was the petroleum drum, adjusted to the desired capacity

(220 kg), which is the amount to be stored for the consumption of a family of five over an eight-month period. On the basis of these conclusions, the first model silo was built easily (see figure 8).

At this point, the effectiveness of the silo + gastoxin (phosphoamine) combination was tested, and research conducted to evaluate the efficiency of the silo in comparison with the loft. Twenty silos were installed in 20 homes, and lofts were monitored.

Silos

Three months later, the infestation and damage rate averaged 30 % in the lofts and was nonexistent in the silos, where maize had been stored with gastoxin. These encouraging results motivated families to use silos. Praise of the merits of the silo was spread by word of mouth, at first ; later, meetings using group dynamics techniques found the silo to be the best solution to storage problems. The question, then, was no longer how to avoid losses, but how to acquire a silo, since those built by a craftsman cost 30 dollars.

Losses

Losses generally ran at about 25 % per 500 kg of maize stored. This percentage varied with the volume : with a larger volume, the percentage of losses decreased, but with a small volume, the percentage of losses was high. This explains why it was those peasants with the smallest harvest who suffered the greatest losses, in the last analysis. In any case, the cost of the silo is actually equivalent to that of the losses induced by diseases over the course of one year, for a family production of no more than 200 kg of maize.

Cost of the silo

In order to reduce costs, the Andes workers thought of having the silos built by the students of a neighbouring technical high school. This would eliminate the cost of manpower, on the one hand, and help students to get practice, while participating in concrete, useful work for the good of small farmers. Unfortunately, the cost of transportation raised the cost to the point where it actually exceeded 30 dollars. While this most interesting experience was useful, in that it met the needs of a first group of peasants, outside intervention still remained necessary. This recourse to an outside intermediary made the acquisition process artificial, since it could not be controlled by the community itself, and eliminated the possibility of having the project evolve into an internal, community process. Two basic elements were required for this dynamic : a supply of silos and training to use them.

There are many types of economic and social relations within these communities, and they must be integrated in the process of adopting and acquiring silos. Institutional aid should perhaps reside at first in providing training for use of the silo, and in getting the supply process and its extension on its feet.

Experience in this field should not be confined to trials, but to the contrary, should be expanded when the outcome is positive. In this perspective, the extension of silos encountered two difficulties : finding materials and finding places for making them. There were not enough drums available on the market, and furthermore, the

cost of transportation increased the cost of the finished product. A raw material that could be found and transported more easily was required, as well as another place for making them. In another community, use of galvanized sheet iron and soft-soldering made construction simple enough to be handled by the peasants themselves.

Contacts were made with a neighbouring community with characteristics similar to those of the Andes programme area, so as to measure the value, for the communities, of making their own silos. Two peasants were easily trained to build silos. Under these new conditions, the cost came to 30 dollars for a silo with a 360 kg capacity, and 24 dollars for a 200 kg capacity. The idea behind this experiment was to set up a large-scale post-harvest programme, based on the Andes experience, and above all on the population's great sensitivity to the problem, and the favourable rumours in circulation about the silos.

«I WANT A SILO TOO»

«The maize in the loft is finished in December», «weevils and butterflies eat the maize faster than we do», «if we didn't have the silo we wouldn't have anything to eat today», «thanks to the silo we could bridge the gap between two harvests», «that's why I want a silo too».

Statements like these are a pleasure to hear, they comfort you in your efforts to make an experiment successful, but above all, they encourage you to go further, to go beyond the simple technical solution of a problem and to engage in more complex mechanisms. As in any development process, there is much to be learned from solving a problem, bringing another one to the forefront and finding a solution to it. Simply, such action should not be conducted without the beneficiaries, and even less, without taking the interactions with nature and the social dynamics into account. It is to these, along with work and creative thought, that we owe advances in technology.

In the case of the silos, although the adventure is on the right track, the work is not over. The programme must now be expanded, and the use of silos as a reliable means of storing maize must be generally applied. It must be kept in mind that however valid an alternative is, it will disappear if difficulties inherent in its cost or inadequate forms of payment interfere with it. The extension of silos must be closely linked to the everyday life of peasants.

In this context, training peasants to produce and use silos and defining types of payment appropriate to the patterning of their relationships are two essential complements to the silo programme. Silos must become a solid link in the chain between the production and home consumption of sweet maize. Then, and only then, will the phrase «I want a silo too» find a concrete echo within the community.

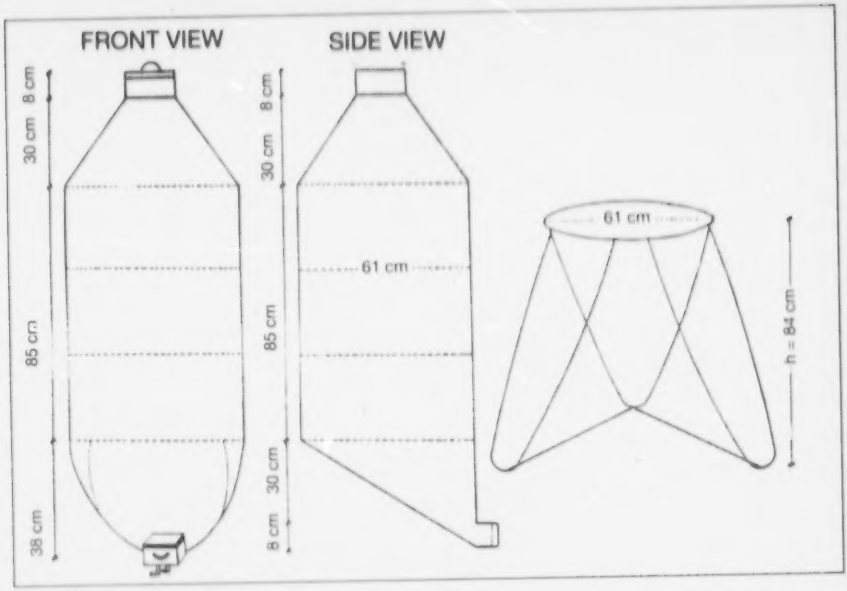

Figure 8 : The family silo

The family silo is made of recycled petroleum drums, the inside of which is painted so that any variations in temperature will be kept out. They are placed on a pedestal, with a hermetic cover on top and a trapdoor on the bottom, for removing the maize. They have a capacity of 200 to 250 kg, corresponding to the average consumption of a family, and are placed under the family awning, or indoors, so as to be sheltered from bad weather or severe fluctuations in temperature. This original model was evaluated after 3 or 4 years of use, and some weak points - the pedestal and the trapdoor - were slightly modified.

GREEN, YELLOW AND RED LIGHTS FOR FAMILY HEALTH*

THE HEALTH SITUATION

The health situation in rural parts of Ecuador is more alarming than in the cities. This has been shown in both the epidemiological surveys conducted by the ministry of health and in the surveys done by Andes. In 1987, for instance, Andes estimated that in the large town of San José de Minas one child out of ten died before the age of 1, whereas in the rural communities the figure was one out of five. One out of three deaths affected a child. One delivery out of ten was done by a trained worker, usually in a hospital or a clinic in Quito. The main causes of deaths were malnutrition, respiratory infections and diarrhoea.

Each district had a health centre : a recent one (about 5 years old) in San José and an older one (about ten years) in San Miguel. Both were relatively well designed. The second, however, was less spacious and poorly kept. In both centres as in the rest of the country, the health team was composed of a rural doctor and a rural dentist. This denomination designates students, who are obliged to do a one-year full-time grassroots internship before their diploma. The team was usually composed of four professionals (two auxiliary nurses, including one specialized in dental care, one health agent and a caretaker), who are the stable, permanent elements. As a rule, the centres functioned eight hours a day, five days a week.

Unfortunately, the health centres were closed or ran at a slow pace at certain times of year, for various reasons : delay in naming new rural doctors whereas their predecessors had already left, strikes, conflicts with the ministry, participation in congresses or in training sessions. In short, the main reason for this sluggishness was a lack of motivation owing to training that was ill adapted - with the exception of hospital care - to the needs of the population, ridiculously low pay, disastrous working conditions, lack of preparation, follow-up and technical support. Often centres only functioned 60 % of the time. In 1987, the San Miguel centre only provided one consultation per fifty inhabitants per year, at best, or 25 times less than the national average, which was one yearly consultation per two inhabitants at the time. Conversations with families showed their striking lack of confidence in these health centres.

About 60 % of health activities involved curative acts for children under age fifteen, often for avoidable ailments such as respiratory and dermatologic infections, nutritional problems and parasitoses ; monitoring of children, and immunization in particular, and the follow-up of pregnant women, was only available to families attending the centre. This very low percentage corresponded to those families living near the health unit.

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Analysis of the health centre records, visits and discussions with families in the communities, meetings and exchanges in the villages showed that while the health teams were not entirely responsible for the situation, they did have a large share of responsibility. It is true that health units cannot solve every question, but a different working method, a more comprehensive surveillance of health integrating preventive and educational aspects, their actual presence in the heart of the community and high-quality work would help to provide solutions. During talks, families always mentioned the fact that the doctors were often absent, and the lack of follow-up : there are good periods, they said, with competent, motivated rural doctors who live in the village, and who we regret when they leave, and others who are like birds on the wing, who come and go unnoticed !

ANDES AND THE HEALTH ASPECTS

Organization of health activities

This, then, is a brief overview of the situation encountered in the two areas, and which was quite similar to that seen in the rest of the country. Andes suggested another organizational model, and the provision of health care based on the analysis of health statistics, the people's demands and reactions, the proposals of both the ministry and the local health team. This meant taking into consideration the fact that families live in scattered hamlets, often with no roads suitable for motor vehicles : geographic obstacles and bad weather reduced accessibility and therefore attendance of the health centre located in town. This problem was compounded by cultural difficulties, since some native families retained their traditional medicine, and tended to resort to their own practices and medication before consulting elsewhere.

Two lines of action were retained : one focussed on the personnel, its work, attitudes and the organization of work, the other on looking for tools to improve the effectiveness and quality of interventions. The middle-term objective was to have positive results to show to the government and university officials, so that they might be integrated in policies and training programmes.

The health teams

Students and field work

Pluridisciplinarity...

In September 1988, following protracted negotiations with the government and the university, Andes obtained the naming of a more complete health team by the ministry, for the rural internship year in each of the two areas. The team was then completed, and is now composed of two doctors, one dentist, and for the first time, a nurse and a midwife, who would also do a twelve-month internship before receiving their diploma (1). These young professionals reinforced the permanent team working in each health centre.

But the team, in the true sense of the term, took a long time to knit together and to function really synergistically : it was difficult for each professional to determine and acknowledge the skills and knowledge of the others, since they had no training in common

(1) In many Latin American countries, nurses and midwives are trained in medical schools : their training period is one year shorter than that of physicians.

...within the health team

and were given different duties during their hospital internships (the only opportunity to collaborate, concretely, during their university training period). Physicians, above all, had a very limited conception of the abilities of nurses : often they viewed them simply as agents carrying out their orders and thought of them as go-betweens between themselves and their patients. At first, then, people had to learn to respect each other's abilities, and a completely different division of labour had to be determined. Many duties normally performed by doctors could be done by nurses.

Sharing knowledge...

and skills

Gradually, the latter would share some of their tasks with the auxiliaries, and even with villagers. The notions of division of labour and delegation of responsibility for work were gradually clarified. Physicians gradually agreed to transmit their knowledge and share their skills, doubts and searchings. This meant that the objective of the entire team was to improve the overall health of all of the population, and not simply the health of that small proportion of people who attended the centre because they were aware of its potential, or because they lived nearby.

Since there were two doctors, there could always be one at the centre, as requested by the people living in the town where the health centre was located, but also, doctors could visit the outlying communities (a two to three hour walk, in some cases), while other team members visited homes as well. Midwives played a fundamental role in this community approach and in developing mutual trust. They easily established close contact with women, since they had a shared interest, recognized skills and the advantage of being women.

...within the development team

At the same time as the health team was being set up and the programme clarified, the pluridisciplinary approach, as defined by Andes, was developed. The health team was not alone in doing this research/action with the population : agronomists, teachers, veterinarians and the entire Andes team was working in the same direction. Through regular meetings, they exchanged information, shared the results and difficulties encountered in the different fields, sought out strategies responding to the needs of families. Thus, through concrete work on a shared subject (improving living conditions for families), the concept of pluridisciplinarity progressed.

University training with a comprehensive approach to health

With the collaboration of the medical school, Andes was able to introduce the notion of a comprehensive approach to health problems into the training curriculum of all health professionals at an early date. It was for this purpose that a ten-week field internship was set up : it introduces students to the activities of health centres, as well as to work in and with communities. They no longer wait until their compulsory year in the country to discover and be trained in this health team work, outside of the hospital walls, with no white jacket - two tremendously reassuring elements, but which do not suffice to enable them to respond to all of the health problems encountered by families.

Public health tools

Collecting information

The first activity of the health teams was to familiarize themselves with the area and with all of the families, an effort that continued throughout the programme. This understanding of the physical, cultural and social reality of the environment enabled the members of the health team to go beyond the limited horizon afforded by individual contacts with patients when they consult at the health centre. But all of the information and data collected had to be recorded, systematized and analysed, to be turned into the memory not only of individual but of family health, an essential instrument for planning work, establishing priorities, organizing follow-up and preparing for evaluation.

Records and family health

All health centres possessed a system for archiving records, with individual record cards showing the clinical history of patients having attended the centre, of very questionable utility, stored in some often dust-covered place. In fact, this system no longer coincided with the recommended health policy, since it considered the pathological elements only, rather than all of the living conditions that affect health. Moreover, it only covered a portion of the population and concentrated on individuals rather than families. Conversely, the family was at the heart of the Andes approach : it was the actor and the beneficiary of improvements and interventions.

The collective memory

It was easy to realize that the archiving system was inefficient, but many more or less successful attempts were made before a more efficient solution was found. The objective was to construct a collective memory that was practical and reflected the pivotal concerns of the programme - a comprehensive approach to health problems and priority for families and the community. This collective memory should enable any health worker - either a permanent member of the personnel or an intern - to rapidly obtain an overview of the community, become acquainted with the area and determine the priorities and the at-risk families on which efforts should be concentrated. This tool should also be evolutive, so as to incorporate the changes that Andes hoped to introduce.

At the start, the team mapped out the different communities, showing the main features of living conditions and family health status. These «eloquent maps» were extremely valuable. However, the problem of up-dating them, and of their complexity, owing to the amounts of information on them, arose rapidly.

The family health record

The idea of geographic archiving (village by village) of family histories - family health records - was then advanced. A record was set up for each family, containing the clinical record cards for each member of the family, when they existed. The cover showed a number of facts pertaining to the family and its members (that is, everyone who lived under the same roof and ate at the same table) : composition of the family, age of its members, facts on housing, social/educational data, main activities, resources, land, etc. The numbers of the existing clinical cards were also recorded

on the cover of the family record. The record also contained an overall family card for noting the results of surveillance of each member's health, the immunization schedule, bouts of disease, death, etc. This family card was the tool for overall health and social diagnosis of the family. These records made it possible to class families on the basis of risk, to tend toward more effective work and to concentrate the means available on the families with the greatest risk, so that they might reach the average level of health of families in the area. Thanks to a series of colours, families were classed within their community on the basis of previously defined criteria : red for high risk, yellow for moderate risk and green for the lowest risk.

All members of the Andes team took part in the establishment of these family records. Each record changed, gradually, as the doctor, nurse, midwife, teacher or agronomist completed it. In four years, 95 % of the scattered rural population had a family record, used by each member of the team.

Filing

The organization of these records was geographic : records for families living in the same neighbourhood, hamlet or community were grouped on a same shelf and filed in alphabetical order to facilitate access to and use of them. The map of the area completed the arrangement, with coloured pins so that each member of the health team (and especially the new members, when changes occurred) could rapidly get their bearings, locate families at greatest risk and take advantage of the collective memory to get to know and understand the situation. The rating method for risk took into consideration the community, family and individual. During diagnosis, three social risk factors had been identified, on the basis of living conditions, pointing to families at risk of undernourishment. They were : amount of land owned by the family, family size and extent of use of family or unrelated manpower for farming activities. Families at greatest risk could then receive the most attention when programming preventive action.

Risks and community

Once the villages, hamlets and neighbourhoods had been identified, Andes worked with the official authorities and members of each community, in general assemblies, to identify the three main health problems or needs perceived by the population. The causal method of analysis brought these problems, and above all their direct and indirect causes, to light, and a consensus was reached between the population and Andes. At this point, action that could feasibly be done by the population, the health centres and Andes began to be planned. On the basis of these priorities and of the feasibility of the solutions envisioned, Andes analysed the problems raised by the different communities and their proposals, so as to assess their possible achievement by the professionals and the population.

Risks and families

Cards and files served to identify the biological, health, environmental and social risks run by each family or individual. On the biological level, incompletely immunized children and

unmonitored pregnant women and children under age one were easy to spot so as to organize their surveillance. Families that had experienced a major health problem were also given priority. Environmental factors included the risk of using severely contaminated water, extremely polluting latrines and household rubbish dumps, the presence of disease vectors such as some insects, rats or animals living in the main room of the home.

Socioeconomic risk factors included a head of household who did not work, illiteracy, a broken home, serious poverty, an overcrowded home. Family records were classed in three categories (green, yellow and red) on these bases, depending on the number of risk factors, so that the health and Andes teams could intensify their efforts in favour of the at-risk families. This meant that home visits would not only be more frequent, but would be concerted, planned around concrete objectives and would involve agronomists and teachers as well as health workers. Once these objectives were met, the family risk would move from the red group to yellow, for instance.

Risks and individuals

Curative care and preventive surveillance were continued on the basis of the administration's norms (number of visits, things to be done at each visit). The overall system enabled the personnel to rapidly call the patient's health and living conditions to mind. It was much more eloquent than a simple individual card with a number and no link with the family and community history, lost in a mountain of records. Often patients have lost their number, and this makes finding the record complicated and long. Thanks to the new tools, and to the family record and its filing system in particular, workers rapidly locate the family and ask questions about the health of other members, such as whether the youngest child has been immunized and the expectant mother is being monitored. On the community level, information on epidemiological aspects, health coverage questions and attendance of centres can be found rapidly, thanks to this system.

A motor vehicle for the health team

At the start of the Andes programme, visits to families living in nearby and outlying communities were all done on foot. For some hamlets, this represented 4 to 8 hours of walking, round trip, with the hazards connected with bad weather, steep, slippery paths, and vaccination and treatment material to carry. This limited the work done, by agronomists and veterinarians as well as by the health teams. There was a considerable waste of time, and a lack of enthusiasm about leaving the health centre on rainy days, while some city-bred professionals unaccustomed to these living conditions found them very trying. It seemed difficult to continue to demand efforts of this sort, especially since it was impossible to cover the entire area in which Andes was based, and to respond to the needs of the population, while doing all work on foot. Once some hamlets

had been reached, there was a scant 3 hours left for working with the families. Andes therefore decided to provide each team with a motorbike, which would enable two workers (health professionals or agronomists) to travel through the countryside.

This new mode of transportation turned out to be advantageous : there were no serious accidents and the cost was relatively low. Distant hamlets are no longer a problem : like the rest of the community, these families now receive support from the Andes professionals, and the personnel is much more efficient, since travel no longer devours considerable numbers of working hours.

FROM IRON... TO BREAD AND LEMON TREES*

ANDES BREAD

Before the Andes programme saw the light, a few specialists from the medical school, some of whom later participated in the creation of Andes, had undertaken a study of the iron status of people living at different altitudes, with the help of the ICC and of French researchers. At the same time, an effort to train both researchers and students had been undertaken. Simultaneously, the research laboratory on metabolism and nutrition of the Quito medical school was modernizing its equipment. Other studies had been conducted in the past on the food and nutritional situation in Ecuador, and all of the findings, put together, had pointed to iron-deficiency anaemia as a priority for public health nutrition.

Prevention of anaemia

Many interventions aimed at eliminating this deficiency had not yielded any noteworthy change, despite serious investments. Whereas the problem to be solved was extremely broad, touching on the food production sector as well as health, the economy and education, people remained cloistered in their own sector, unaware of what the others were doing, and there were practically no exchanges between the various disciplines. Furthermore, most of the programmes aimed at improving the situation had been designed and developed without the participation of families, and without taking their experience and potential into consideration.

There were several possible strategies for improving iron status. Iron supplementation, which means providing iron in medicated form, is a necessary solution when a serious deficiency exists and a rapid change is desired. This is a demanding, costly method and cannot be extended to an entire population group for an unlimited period of time. Fortification involves adding iron to some judiciously chosen food. This is an inexpensive method, the value of which has been tested in some countries, and one that can reach an entire population. The difficulty resides in the choice of the «food vehicle» and in the form of iron used for fortification. The food chosen must be consumed in sufficient amounts by the target group. The fortification process must be centralized, the preparation must be stable irrespective of storage conditions, and must not change the consistency or taste of the food, and the price must be acceptable.

Various foods have been fortified with a number of nutrients in some countries, depending on local risks of deficiency. In Ecuador, for instance, salt has been enriched with iodine, and margarine with vitamins A and D2. During a pilot project, wheat flour used to make pasta was fortified with iron ; this idea arose because the population, and the middle-class and poor strata in particular, eat large amounts of pasta.

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High prevalence of anaemia

Large consumption of carbohydrates

A survey of the iron status of families living in the Andes programme communities had showed a high prevalence of iron-deficiency anaemia, and a study of the typical diet clearly showed the heavy consumption of grains, roots and tubers (the iron content of which is poorly absorbed) and low consumption of food of animal origin (with a high iron uptake). It was useless to advise families to eat more meat, given the food available locally and the cost of meat products. Another method had to be found to improve iron status.

Blood, synonymous with life

In conversations with families, the professionals had gained insight into their perception of anaemia. The word «anaemia» does not exist, but a thin child is considered anaemic. A face with «colour» indicates abundant blood, a satisfactory diet and therefore good health. Blood is synonymous with life. Through understanding of this traditional wisdom, preventive and educational programmes could be more accurately targeted, and actions based on scientific and traditional knowledge and respecting cultural factors could be implemented.

The Andes programme decided to improve the iron intake of villagers by the local fortification of a food frequently eaten by everyone : wheat flour. In these communities, bread is valued, and technically speaking, flour is easier to fortify than any other substance. Moreover, preliminary contacts with the people in charge of mills at the national level seemed to indicate that collaboration with them for the extension of the programme would be feasible.

Cottage industry bakeries

The first attempts to make iron-fortified bread were conducted at the Institute for technological and industrial research of the Ambato technical university, with the help of an engineer who was greatly interested in the Andes approach. Furthermore, his father was a baker ! During this applied research phase, in which the manufacturing process was experimented to obtain the best possible product with the simplest recipe, the process of sensitizing people was pursued, and projects saw the light in some communities. The role of iron in the human diet and its effects on health were discussed with families and schoolchildren, as had been done previously, during the surveys.

Fortified bread made in schools

Since the prevalence of iron deficiency was extremely high among schoolchildren, it was decided that bread should be made in schools, under the guidance of mothers, with the teacher as coordinator. The village of Anagumba was the first to embark on the adventure of Andes bread. But where would the bread be made ? A community-owned piece of land was available near the school, and the community set out to build the bakery : it was a cottage, made of traditional materials according to plans draughted by engineers from the engineering school (civil engineering department) and inspired by the local architecture so that it would fit into the landscape, culture and life of the community without disturbing the pre-existing harmony. It was to contain a traditional wood-burning oven and a small room for

storing the ingredients, preparing the bread, and organizing its distribution and sale. Most families in this community cook on wood-burning stoves, but a few have chosen gas, so that the discussion over the choice of a fuel for baking the bread was a rough one. Indeed, wood is increasingly scarce in the region, and there is fear that the reserves will soon be exhausted. This obliged the village to purchase wood for bread-baking at increasingly high prices. Interestingly enough, these negotiations showed how ecology-minded the inhabitants were : «if we cut down trees for burning, the chances are that the drought will be more severe, and crops less profitable», they argued. Finally, the idea of a traditional oven was abandoned, and a small gas-burning oven was installed.

In other communities, the oven was set up in the schoolhouse or in the home of a community leader. Next came the choice of equipment, which should be similar to that used in homes, and make it possible to use containers whose content has been weighed, and which will serve as references. Once all of the equipment was collected, mothers were trained in bread-making, and this training continued until they were able to make high-quality buns, both tasty and nutritive as well as attractive (by their colour, smell and consistency), to be sure they would be acceptable.

The buns made by the mothers weighed about 70 g. The ingredients were wheat flour, fat, sugar, milk, eggs, leavening, salt and water. Fortification involved ferrous sulphate (30 mg/kg of flour). These buns were distributed to schoolchildren for their snacks. They afforded calories and proteins as well as iron. To make sure that the amount of ferrous sulphate incorporated in the recipe by the mothers was scrupulously exact, it was weighed and packaged in small plastic bags in Quito by the pilot team, in amounts corresponding to the production of a given number of buns. The mothers had only to dilute it in the predefined quantity of water and incorporate the preparation in the bread dough, to achieve equal fortification.

Teachers participated actively in distributing the buns to schoolchildren. The pilot team had calculated that each child should receive two buns a day to meet iron requirements. Some mothers soon began to complain that their children had lost their appetite, and refused to eat the evening meal at home. The ration was therefore reduced to one bun a day. Children sometimes helped to make the bread, as part of their curriculum on health/nutrition, food and the role of iron.

Evaluation

Visits were made by professionals at regular intervals to see that the recipe was properly respected and that consumers continued to find the bread delicious. For a while, the laboratory assayed a few blood specimens to check on the effect of this fortification on the children's iron status. Samples of the bread were also assayed for iron content. Some communities not only distributed the buns to schoolchildren, but sold them to families.

Readers should not imagine that this all went easily, with no problems. Some conflicts over power arose between women, some of the trained mothers abandoned their responsibilities, and there were difficulties in transmitting knowledge. After a few years, when the communities continued the «fortified bread» activity on their own, some produced the bread regularly, others sporadically, but all experienced difficulties in maintaining the original high quality ; sometimes certain ingredients are lacking, and especially milk and eggs, for financial reasons, and ferrous sulphate may be lacking because of customs problems with Chile.

The bread-making and consumption aspects of this programme were positive. For instance, one of the communities not only met the objectives set, but went beyond them and developed other activities. It sells bread, fortified or unfortified, on the roadside, along with the cheese produced in the community workshop, in order to provide financial aid to the programme for schoolchildren, and even to make some profit. The business logic is constantly present, and motivates communities : it is a major factor in sustaining the activities.

What is at issue now is the extension of the programme to the regional or national level, since the Andes project was begun in line with government policy : first, to offer every schoolchild a snack that would complete the daily family ration, often containing insufficient amounts of calories and protein, and secondly, to reduce the prevalence of iron deficiency. Many working sessions have been held with the private and public sectors, aimed at extending the programme, on the basis of the Andes experience. Work has continued in research laboratories, but governmental and international decisions are long in the making, and planning a project of this sort has turned out to be more difficult than expected.

FROM IRON... TO LEMONS

Scientific studies had shown that vitamin C acts as a facilitator for the uptake of iron of plant origin. The survey on anaemia had shown the high prevalence of iron deficiency in these groups, and the community diagnosis had discovered the habit of drinking a lemon-based drink, and offering it to visitors as part of the social ritual. Agronomists had found that this drink was often lacking since the peasants had few lemon and orange trees. Production was insufficient, and they tended increasingly to resort to manufactured products : fruit-flavoured powder or gelatine mixed with water. The peasants had mentioned their preference for lemon juice, which «quenches thirst and makes the meal go down».

Biochemical studies, epidemiological surveys, observations of real-life situations and investigation of skills and beliefs, meetings and communication with families during home visits were all used to set up a programme entitled «from iron to lemons», proposing that peasants plant lemon trees and providing further knowledge about how to care for these trees.

An action of the same type was launched in schools : planting lemon trees, teaching children how to cultivate them, preparing and drinking juice, learning about the role of vitamin C, etc.

This programme, developed at the start of Andes, played a major role in concretizing the pluridisciplinary work done collectively by peasants, agronomists, teachers, children and health teams, the application of the method based on the real-life experience of families along with scientific experiments, to design appropriate action decided and applied cooperatively by all. The development of fruit trees also turned out to be extremely valuable.

RELIABLE WATER... CEMENT OF SOCIAL ORGANIZATION*

THE SITUATION

During one half of the year, rain is abundant and frequent in the north-west of the province of Pichincha. The water that runs off the sheet-metal roofs is recovered by gutters made out of bamboos cut in half lengthwise, and runs into metal or cement tanks. These reservoirs are not covered, and there is no protection for the water, which is used for cooking, drinking, laundering, washing and for the animals. In summer, when it does not rain, people must walk great distances to the nearest stream to wash and do their laundry, and carry the water needed for household uses.

In La Cocha, an irrigation canal brings water to the village, after which it must be carried to the homes. In Anagumba, water from a small, uncovered tank threatened by all sorts of contamination is piped to two public taps, but these are often out of order because earth enters them and plugs them up.

The problem of the water supply, both of its quantity and its quality, was mentioned by communities as a serious, urgent one. Serious faecal contamination was found in the reservoir water : 80 % of schoolchildren had intestinal parasites (amoebas, worms) and after three months of treatment they were contaminated again. Diarrhoea and skin infections were frequent. People were resigned and accustomed to these, and paid little attention to them.

Neither the health teams nor the agronomists, teachers, veterinarians or sociologists had the competence needed to solve this problem. But the communities were ready to work, to supply building materials, etc. No-one was capable of doing what was needed to bring water to the families, except at a prohibitive price.

The Ecuadorian institute of health construction work received demands from throughout the country, since a scant 30 % of the rural population had a «reliable» water supply. Priority did not go to small communities, since the towns themselves did not all have water. The engineering school of the Central University (department of civil engineering) then offered its help to Andes. A group of students decided to use their know-how to serve communities, by chosing a water-supply project as the subject of their thesis. Once they had conducted technical studies based on inexpensive materials, they accepted to go beyond the planning stage and to help the communities by living with them and managing the actual construction work for about one year.

Families played an active role in all phases of the programme presented below : in making the demand, planning the construction, doing the work itself and afterwards, in maintaining the canalizations and taps, as well as in regulating and managing the water.

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An alternative method

The terms «community development», «harmonious development», «autonomous development», «autonomous change» (1) are used in conceptualizations, and induce action aimed at the qualitative improvement of the living conditions of disadvantaged population groups.

The improvement of the living conditions of disadvantaged population groups is a concern of both the Ecuadorian government and of non-governmental organizations, but often it receives lip service only, with great explicit contents but relatively little concrete action at the structural level. It therefore became urgent to develop and experiment new methods if community development was to become a reality.

Andes has designed, then effectively put into practice, a methodological approach facilitating the development of rural communities. This experience is part of «autonomous change», which restitutes and reinforces the internal organizational capacity of communities, by integrating such essential elements as action/research, social organization, pluridisciplinary work, training of professionals, popular education, demands for health and education services as well as the participation of a number of sectors. This method for improving health is presented here through the experiment in supplying «reliable» water (2).

COMMUNITY CONSTRUCTIONISM

The traditional methods used during work in rural communities is often characterized by the fact that the participatory process is directly or indirectly hindered by vertical relations between peasants and technicians, the harmful effects of paternalism, limited integration of technicians in the communities and their ignorance of sociocultural and environmental factors.

These attitudes are an obstacle to the development of the community's creativity and its concrete expression, as well as to the evolution and consolidation of the social organization. Andes therefore developed a different working method, and tested it at the grassroots level. This method favours the qualitative improvement of the living conditions of both children and adults : it is what the authors translate here as «community constructionism».

Community constructionism is based on an ongoing process using a systematic, progressive method involving community participation. It constructs its own development programmes, counting on a strong social organization and integrating a series of environmental, cultural and epistemological elements. This requires taking time for thinking and time for action, and vice versa.

(1) The authors often employ the term «ajuste autonomo», in Spanish : we have rendered it by autonomous change.

(2) The expression «reliable water» differs from pure water or drinking water. Reliable water does not meet the chemical and bacteriological criteria of drinking water.

The role of the pluridisciplinary team (1) is to facilitate and orient the development programme. Since the professionals are integrated in the community, they completely, totally and constantly live with, participate in, think and act with the community. They are no longer outside agents, although they do conserve their competences and their personality.

PHASES

The community constructionism method used to install reliable water systems involved several phases : evidencing the problem, increasing awareness, planning and negotiations, implementation, follow-up of the water supply systems, evaluation and feedback.

Evidencing the problem

Integration in the life of the community is a sine qua non condition for the real-life method. This involves an approach to concrete reality aimed at working in complete confidence with the population, being informed of their everyday life and gradually interiorizing their problems. This is why the professionals who constantly participated in the activities and life of the community were able to make use of their knowledge, cultural expression, worldview, daily-life practices, etc. By sharing the everyday life of the community, professionals were integrated, and became members of the community with a recognized place within its social organization, but without relinquishing their critical sense.

The community was able to express a number of collective needs during working meetings, focus groups, interviews and conversations. This analysis of the situation and identification of problems and needs, felt or unfelt by the community, enabled the professionals to gain a real, thorough understanding of the situation. This is what some writers call participatory diagnosis.

«We don't have any social centre for organizing festivities», «the road is in bad shape», «we want a chapel for communicating with God», «there are insects in the maize». The place occupied by health and education in these concerns, expressed by communities, is quite secondary.

«We have always fetched water from the river, collected run-off water and rainwater, and we are not dead», «we want the water, now very far from our village, to come to our home, even if it is dirty», «the water we use has germs in it», «our water is dirty and bad, it hurts our children»: these are some of the diverging perceptions of the water problem, as expressed by various individuals.

Increasing awareness

This phase went on throughout the process, and involved periods of reflection on the lack of reliable water, its causes and consequences. Following critical analysis, the negative aspects of this situation were acknowledged and the problems and needs repertoried on the basis of priority.

(1) The pluridisciplinary team is the «facilitator» of the community development process. This team includes agronomists, physicians and educators, who enrich, conduct, guide, catalyse and make feasible the development of autonomous change.

Individual opinions were collected and discussed, with the help of the specialists. Then, gradually, each family and the community as a whole came to realize that the lack of reliable water was a fundamental problem and a health priority for the community. «Why don't we have good water ?» asked a peasant, then. «The government doesn't take care of us», «we don't have money for it», «it's because we're poor», «it's not a problem for me, I live right near the river», «it's because we're not organized», «we'll never manage to have water», «we want good water» are some of the remarks heard. «Why don't we organize ?», «we should ask the project doctors to tell us about the diseases caused by water».

Meetings, educational days and dialogues with families were again organized in the communities. Gradually, this sensitization period led to shared reflection on concrete activities that would solve the previously identified water problems.

Planning and negotiations

This step involved defining objectives, programming activities, inventorying resources and decision-making to improve the supply of reliable water with a view to improving health, among other things.

The communities were determined to rely on their own strength and asked Andes to help them. The strategies for the work and the responsibility of each individual were defined, with the help of the specialists. The communities pledged their manpower (mostly in the form of mingas) and also local materials such as stones, sand and rubble, designated by the technical studies. The Andes technicians and those from the school of engineering participated in building the water supply systems, furnished the material that was not available locally (cement, iron, pipes, taps, etc.).

Slowly but surely paternalistic attitudes waned and the communities took direct action, thus accelerating their development process.

Implementation

This construction demanded a great many mingas, which is to say, work days attended by the entire village community (about 45 mingas for Anagumba and 32 for La Cocha). At the meetings, the community leader asked the men and women to decide what days and hours they would work to build the water supply system. «We need tools», «we need horses to bring in the stones», some people remarked. Others answered «I have a horse», «I'll bring two shovels». The men did the hard labour while the women prepared the meals.

The dynamic was sustained, during this phase, by the occurrence of unexpected difficulties requiring more thought, decision-making and agreements, followed by the application of new strategies. For example, the question of where to place the taps was subject to hard negotiations in each village. Each family wanted the tap to be as near as possible to its home, and this is

normal. But the number of taps had been defined in advance, and the decision as to their location had been based on the distances and number of inhabitants, but also on the slopes. The final decision was in the hands of the communities.

It took one year of hard work for the community to achieve this ambitious objective : reliable water to improve health status. To the great satisfaction of families, homes and schools now have water available nearby. This availability of water has considerably improved consumption, but also cleanliness. Here are some other remarks : «We no longer have to use the dirty water that comes down the river, or from the well, where the cows are». «We no longer have to carry water in tins or pots for a half-hour or an hour». «Thanks to Andes, for helping us in this undertaking».

In the schools, children's hygiene has also improved. On the same principle of negotiation, planning and village assemblies with the technicians, the project has helped to build sanitation facilities (sinks, showers, toilets) and to implement education for hygiene programmes. Children now take 2 or 3 showers a week instead of 1 or 2 every two weeks. A definite improvement in personal hygiene and cleaner clothing has been observed. Skin infections are now exceptional. The children seem happy : they live, play and learn in a much more conducive environment.

Follow-up of the systems

The process did not come to an end with the building of the water supply systems ; there was a need for permanent follow-up of their functioning, and maintenance of the supply systems. As time went by, various problems arose : taps leaked, the pipes broke, some families wasted water or were cut off, the capture and storage reservoirs were contaminated, the chlorine content was improper.

The communities and professionals met again to assess the situation and sensitize families about the proper use of water. The water supply systems belonged to the communities, it was up to them to make sure they functioned properly. The communities then decided to contribute regularly to a fund managed by the community (500 sucres at first, then 1,000 sucres monthly) (1). The money collected was to be used to purchase the small items required for maintenance. «Water meetings» were set up, and repairs or overhauling are occasionally requested.

These water supply systems functioned without any legal status, however, and this problem was soon raised, and entrusted to a jurist representing the community and acting on its behalf.

Ongoing evaluation and feedback

All along the way, the community and professionals expressed value judgements on the process engaged, its problems and limits. Evaluation made it possible to correct some orientations, to

(1) 1 US$ = about 2,000 sucres.

improve the community organization, look for alternative strategies, implement other action, organize more mingas and take complementary steps.

THE METHODOLOGICAL MODEL

The community constructionism method may be depicted by a diagram showing the different phases. In fact, it is a continuing process in which the various components are complementary and mutually enriching, within a harmonious process (figure 9).

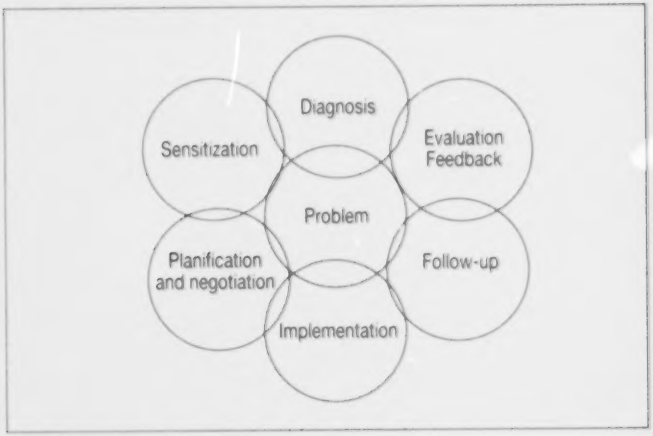

Figure 9 : Diagram of community constructionism.

SOME REMARKS

The following lessons may be drawn from this experience in working with the rural Andean communities :

- a theoretical base is absolutely necessary for the establishment of a method for promoting the type of community development presented here under the denomination of «constructionism» ;

- community development is possible if the communities themselves design their development and managerial process. They are the proprietors of their history and their future ; each community must therefore achieve a degree of maturity enabling it to interpellate the administrative structures in order to know about plans and resources, to establish and participate in changes, and make them operational. Communities are the true protagonists of development, and they must be the subjects rather than the object of it ;

- every community development process must be able to integrate all of the human, social and environmental aspects that lend meaning and reason to the everyday life and long-term perspectives of the population ;

- popular knowledge as well as values and practices are essential parts of any development process. From the outset, then, the

historical authenticity of the community should be acknowledged, so that it may express its aspirations.

Cultural aspects and their expression cannot be omitted in any work with communities. Culture, in the sense of all of the fruit of the relations between people and their natural environment, takes the concrete form of a family and social organization : mingas are one original example of such culture, and have been perfectly integrated in the development process.

Conclusions

Community constructionism, as a working method, was an interesting experience for Andes in stimulating community development in rural localities, around high-priority projects designed with and in the community.

The qualities of this method include the active participation of the community, the integration of professionals in the community, the acknowledgement of the primordial importance of horizontal relations between the community and the pluridisciplinary team, the consolidation of the social organization, the decline of paternalism and the integration of environmental, cultural and epistemological factors in the entire development system. This is a harmoniously constructed process integrated in the reality of peasant life.

FROM CREATIVE SCHOOLS... TO DEVELOPMENT*

THE SCHOOL SITUATION

In Ecuador, 54.9 % of poor children and adolescents live in rural areas and 23.5 % of them have never attended school. In rural schools, 27 % of children are left back and 53 % drop out. Only 47 % of schoolchildren finish the elementary cycle, with an average length of attendance of 9.6 years, whereas they are supposed to stay 6 years. These alarming figures, issued by the ministry of education in 1993, also pointed to an illiteracy rate of about 10 %, mostly affecting rural areas.

Villages without a school...

There are several causes behind this situation, the main one being the shortage, and sometimes the total lack, of facilities. Many villages do not have a school. This was the case in several communities participating in the Andes project. Educational material is in short supply and often is composed of isolated tools with hardly any educational basis. School goes on with no breaks. The children, who have travelled great distances, and often with very little or nothing in their stomach, find it difficult to concentrate.

Teachers are isolated

Teachers often have one-class schoolrooms grouping children with different levels, a system that is hard to handle when one has not received adequate training. They are very isolated when facing the many problems involved in educating these children, and further, there is very little supervision. The pay is poor and the lodgings inadequate, and this, along with the solitude, makes it difficult for them to feel motivated, particularly since some peasant families, especially those in the San José region with its majority of Indians, felt that the education dispensed at schools did not correspond to their everyday needs. «What is done in the community has nothing to do with what is done at school», said one of them. «I'm not going to the minga organized by the school, because I don't have any child in that school», said another. So they took every opportunity to avoid sending their children to school, especially in the case of girls, whose work at home is specially valued.

Lack of motivation

Children with no civil status

At the demand of the community, Andes supported families who wished to build a school and obtain a legal status for the school they had built with their own hands, along with the nomination of a teacher. After all sorts of administrative applications, made with the help of Andes, the request was categorically refused, the argument being that 20 of the community's children had no legal existence. Their parents had not registered them at birth. Registration is indeed a trying, difficult act, which must be done at an office located far from the village, and where one is often given an unpleasant reception. If a child is not registered within a short period after birth, the parents are fined heavily when they file their declaration. When Andes tried to help to register these children, the situation was even more complicated, since they were over

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age 5, and legal action had to be undertaken. Only after 3 years of procedures, the payment, by Andes, of lawyers' fees and administrative charges, trips to the capital and a considerable loss of time, did the children finally receive their birth certificate, entitling them to request a teacher. The same difficulties were repeated in other communities. This was one of Andes' contacts with legal problems : it was very important for the professionals and for the community. This legal sector plays an enormous role in day-to-day problems, and many technicians are not at all trained in this field. One wonders how families such as those encountered in these villages could manage these situations alone, without experience. And yet, if they are to gradually become a part of the modern world, they must integrate a modicum of legal notions.

Basic legal notions

ANDES AND SCHOOLS

One of the basic ideas of Andes is to lean on schools, so that they become a lever for development and an integral part of any community action. For this to happen, schoolchildren must participate in activities and when possible, even impel them. School programmes should be better adapted to the realities of peasant life, and not be oriented exclusively towards urban life. To achieve this, children were involved in classroom activities linked to the needs diagnosed, and to the activities of the adults, but in a form appropriate to them. School thus played a role in sensitizing parents, who observed, commented and gradually put into practice some of the innovations introduced at school, while adjusting them to their own constraints. Once they had experienced certain things at school, children told their parents about them. Through their tales, and the pressure they exerted, as well as through exchanges between parents and teachers, changes occurred in people's ways of thinking and doing.

Upward education

Andes wished to experiment the concept of upward education : that is, the changes that schoolchildren can produce in adults through exchanges, teaching them new skills or attitudes that they have learned, and also activities that they did and for which the family's support was needed. Andes wished to improve educational programmes and teaching methods in several fields, so as to bring them closer to needs and to reality. School then transmits a real education - that is, knowledge, skills and attitudes - knowledge, know-how and knowing how-to-be, and not simply instruction. Last, Andes had the objective of reinforcing the role of the school in training future actors in development and also of being a motor itself.

Divorce between school and community

Integrating schoolchildren and schools in the Andes programme was a real challenge. It was a battle against prejudice, since there was a deep divorce between school and community, which seemed to belong to two different worlds, two systems separate from each other. On the one hand, a class, enclosed in its four walls and focussing on knowledge with an essentially urban connotation, and on the other hand, a village community whose objective was above all to meet its own basic needs, and was far

from thinking about schooling. The gap was enormous, the gulf between school and village was deep, and particularly so in communities of natives, where some teachers did not wish to be integrated in the village and peasants did not participate in school life. Schoolchildren lived a double life, so to speak, and there were hardly any bridges between the two worlds.

Education about food consumption

Following diagnosis of food consumption, it was decided, in agreement with families, to attempt diversification of the monotonous, maize-based diet by introducing vegetables and fruit, although the families did not view them as very nourishing. A study of the food available, its composition and complementarity, origins and seasonality of consumption, but also of those foods that had gradually been abandoned and the reasons behind this, sensitized villagers to these questions. This period enabled them to learn facts that were helpful in analysing their own diet, its insufficiencies and how to improve it. Families and professionals working in the villages and those coming from the university also had time to familiarize themselves with these notions and to gain enough distance to be able to analyse, understand and respect these eating habits.

Sensitizing families

Sensitizing schoolchildren

A similar effort was made in the schools. It took into consideration the steps in children's development, their potential for cognitive achievements and acquiring skills, and a progressive programme was then proposed. These aspects did not exist as such in teacher training or school programmes, but some officials at the national level showed interest in this type of learning, and came to help Andes. Nor were there any teaching materials appropriate for rural schools and for this sociocultural context.

In the San José de Minas region, the Indian culture is still very lively, and three major traits were emphasized in the school programmes. The first is the strong link between people and nature, the earth being viewed as the mother : it is a part of the community, and everyone in the community is related to the land. There is something of a mutual bond between the earth and native peasants ; working the land is part of everyday life, with both children and adults doing farming, each with his or her specific tasks. Knowledge, values and skills pertaining to the different phases, from production to consumption, are transmitted from one generation to the next, and education through imitation plays a major role. The second important element in this culture is the community-based organization which, although not as strong as would be desirable, is still quite present, and the community has preeminence over the individual. Community work is quite present during farm work and village construction work. It takes the form of mingas, attended by all of the families. Last, the relation with God is a foremost element. Religious and philosophic conceptions are expressed through rituals, celebrations and ceremonies, intimately tied to the triptych God-human community-earth.

Education through imitation

TEACHING MATERIALS

The same diagnostic approach to dietary consumption was undertaken in the schools : schoolchildren discovered and became aware of the composition of their diet. They drew pictures of the

food they ate, along with its nutritive and symbolic value : food considered hot or cold, light or heavy, food that is filling, the therapeutic value ascribed to some products, etc. Educational material was developed to show pictures of the food eaten daily, and to enable the children to suggest solutions to the village's food problems, through play, and to understand what a balanced diet is, and the role of food in health, through exercises.

Dominos

Agronomists, doctors, nurses, teachers, educators and parents participated in designing this material, made of pieces of wood (like dominos), on which the local foods were drawn. They may be arranged on the basis of nutritive value, colour, origin (animal or plant), place of production, harvest season, etc. Many games were organized, depending on the teacher's educational objective - be it to suggest balanced dishes, give some notion of geography with the help of the farm products used as food staples by various peoples around the world, etc. Games such as dominos, mother goose and bingo, body expression (with children imitating each food and doing little sketches) awakened the schoolchildren to these questions over a number of months, and prepared them for the next phase.

A grocery shop

The children then organized a school grocery shop, whereas their parents were thinking about the construction of a village shop. They began to play at selling, using a few goods brought in by some children. The teachers' objective was to teach the children about food : how to compose balanced diets using local produce, but also how to weigh, how to purchase and compare prices with respect to nutritive value, so as to give children an introduction to mathematics and to the influence of food on health.

Food preparation activities were organized, to teach the children how to cook and eat in conditions similar to those encountered in their home, while communicating basic notions of hygiene and of those food combinations that provide a more balanced diet. This also helped children to learn to discover the taste of local products that they did not usually eat, and especially of some vegetables. It is in this framework, too, that the production of fortified buns was set up, for consumption by the schoolchildren and sale to families.

School gardens

Andes aimed at an active school, then, one in which the beneficiaries participate in acquiring knowledge, so as to achieve change through back and forth movement between theory and practice. Like the community, schoolchildren are both the creators and actors in the educational processes combining action, education and learning skills within their own environment. The role of the teacher is quite different here. It is no longer to hand down instruction. Teachers act concretely, with the children, within the programme. They then return to more theoretical aspects from time to time, to re-situate each piece of information in a broader context. It is in this context that school gardens were inaugurated.

Objectives

The objectives of the programme were :

- to improve children's knowledge about growing vegetables and the importance of eating them to diversify one's diet ;

- to help the children to learn about the production of those vegetables that families appreciate, and that are adapted to the local growing conditions (land and weather) ;

- to provide opportunities to eat these vegetables at school ;

- to use the vegetable garden as a way of promoting attitudes of cooperation, responsible action, self-esteem and self-confidence, motivation and appreciation of work.

Gaining skills

Continuity of efforts

Objectives specific to each cycle were planned, both with respect to knowledge and know-how, so as to advance as the children gained skills in the course of their elementary school years. Much emphasis was placed on the need for pupils to be attentive, with the notions of follow-up, assiduity, and gradual realization of the concept of time, future prospects and planning, all applied to gardening.

At the beginning of this programme, the teachers were given training in farming techniques and in the use of this active educational technique calling for listening to the children and taking their questions into consideration, in view of their overall development. A document, specially conceived for the school gardening activity, was established by an agricultural engineer, the educational officer and the local doctor, and distributed to the teachers.

The various phases of the children's activity followed the logical order of farm work, from the selection of a piece of land near the school and a stream, protecting the land using local materials, to avoid having the crops destroyed by animals, preparing the earth and plots, sowing, weeding, dealing with humidity and drought, diseases, etc. Then came the harvest period for the different crops planted, and last, their consumption in the form of a number of balanced dishes prepared at school.

Evaluation

At the end of these school garden activities, Andes evaluated the knowledge, attitudes and skills of children in some communities, considering their age and the educational objectives set for each cycle. The method and tools used for evaluation have been described in the FAO journal (1). They show that the children had progressed well, and suggest that other similar activities be encouraged.

The positive results as to self-esteem and self-confidence and the appreciation of work are noteworthy, since these are important values within the Andes programme, which aims at doing away with the resignation and submissiveness and attempts to help people to regain hope and confidence. Cooperation, motivation

(1) Food, nutrition and agriculture. Rome : FAO, 1996 (in preparation).

and responsibility were relatively less satisfactory, according to the teachers, but this may be because they are more demanding in these respects. Furthermore, in long-term experiences, children of that age always find it difficult to pursue their effort, especially when they must go through what they perceive as repetitious motions such as watering regularly or weeding over and over again.

From the school garden to the family garden

Following the creation of school gardens, some children and parents were eager to obtain seed to produce new vegetables in their family garden, or to begin a garden. It seems to us that this request, followed by the implementation, at the family level, of the skills acquired at school, is in itself a positive element in the evaluation, and an indication of the success of upward education, even if it only concerned some of the children. Parents, made aware through Andes of the importance of diversifying their diet, accepted and even encouraged the reproduction of the school garden at the family level. The pursuit of this activity over several school years and the evaluation, by the children, of the difficulties and successes of the family gardens should yield incitement for broader diffusion of this type of programme.

Raising guinea pigs

Schools, as experimental centres for the community, began to raise guinea pigs. Parents came to observe them, discussed the advantages and disadvantages, commented the activity among themselves, and the idea took hold !

Improving hygiene

But how did this activity develop ? During diagnosis and home visits, all of the professionals had mentioned the presence of animals, and particularly of guinea pigs, raised in the main room, which is often the only room in the house, and in which the family lives, cooks, eats and sleeps. During conversations and village meetings, this promiscuity was discussed, among other hygiene problems but each time the families claimed that the animals could only live inside their home, since the semi-darkness and temperature facilitated their growth and reproduction, and they could not be separated from people. The Andes officials had dropped the issue, feeling that the time was not yet ripe to improve the situation, except at the price of conflicts producing results that would be minimal and sort-lived.

Improving animal protein intakes

Improving animal protein intakes was one of the objectives defined by Andes. Should small animal-breeding be encouraged, to make sure that at least some of the animals would be consumed by families and all would not be destined for sale ? In these Andean communities, guinea pigs are eaten occasionally, on festive occasions, and every family raises a few guinea pigs. In the local culture this animal is linked with social relations, since to offer a dish of guinea pig is a sign of respect and esteem. Guinea pig is served at baptisms, celebrations and mingas, and this lends solemnity to these occasions.

In agreement with the parents and teachers, it was decided to breed guinea pigs at school, for several purposes : to experiment breeding techniques outside of homes, and secondly, to serve guinea pigs to the schoolchildren. Another objective was to take advantage of the upward educational effect to sensitize parents, and perhaps encourage them to develop breeding of these animals, not in their homes this time, but near by, so as to improve sanitary conditions.

The guinea pig farm

A plan was designed for the guinea pig farm : it was a small building inside which boxes would be placed : these were sorts of small enclosures in which to separate the guinea pigs on the basis of their physiological development. The Andes professionals helped to design and plan this project, so as to establish a balance between the peasants' local breeding techniques (informal education) and present-day scientific information in this field (formal education), especially with respect to ventilation, sunlight and temperature, since any sudden change is damaging. The teacher and pupils learned about the life of the guinea pig, how it reproduces, what it eats, its hygiene. Andes took charge of buying the first guinea pigs : 8 females of the local variety and one male of an improved species, so as gradually obtain larger animals while preserving the hardiness of the local species. Often, women came to the school guinea pig farm to leave their female with the male for a few days so that he would cover her and thus improve the family's own production.

Use of guinea pigs

With the help of the teacher, the schoolchildren set up an organization in which each in turn brought in what was needed to feed them, and took charge of surveillance and cleaning up. The teacher kept a diary, showing production, sale and consumption. The original idea was to feed the animals peelings, grass and leaves collected in the area, as the villagers did, but this soon turned out to be insufficient, since the average intake of a guinea pig is about 250 g of grass a day. Fodder and sugar cane had to be planted, and land had to be found for this, and the children's work load increased.

Then came the time for eating some of the guinea pigs. The others were sold and the benefits went to purchasing some equipment for the school, to improve learning conditions. A three-month-old guinea pig weighing about 1 kg sells for an average of 3 dollars. The profits made by the guinea pig farm were quite appreciable, since these animals are highly productive : gestation lasts three months and females carry an average litter of 5 young.

Role of the schoolchildren

The teacher encountered some difficulties, especially in managing the farm : it was sometimes difficult to demand that children be sufficiently regular in cleaning and feeding the guinea pigs. For instance, a pupil in charge of caring for them during a several-day holiday lost the key to the small farm building and didn't dare admit to it : several animals died of hunger. Despite this, the activity yielded positive results. At school, the guinea pigs were eaten and liked by the children : despite a larger production, they

Evaluation

continued to be consumed on festive occasions, as usual. Some animals were sold and the money went to the school fund. Education-wise, the children acquired new behaviour, knowledge and skills. The communities gradually accepted the idea that guinea pigs can be raised outside of homes, and families built small sheds and began guinea pig farming. Most of the original objectives were met, sensitization took place without any conflicts, the whole community focussed on the same action and all of the families adopted the same behaviour, but each at its own pace.

The future

Some questions remain, however : will the solemnity surrounding the consumption of guinea pig disappear as production increases ? Should schools be encouraged to develop this activity, since its management is demanding, especially during school holidays ? Or should experiments of this type be undertaken as a methodological tool to offset the difficulties connected with traditions, using schools as motor and effective actor to impel change, creativity and progress ? How can at least some of the profits obtained by families when they sell guinea pigs be used to purchase other food with a high nutritive value ? This touches on the whole problem of teaching management of the family budget.

Only a few of the school programmes have been presented here : others were undertaken, especially in the field of hygiene, when the first epidemic of cholera hit Ecuador. Sketches were developed by children and given to the villagers. During the community project for bringing water to the villages, in which the schoolchildren participated, programmes on clean clothing, body and food were developed. Management of water was learned when showers, sinks and toilets were put into the schools.

SOME REMARKS

Consumption, school and family practices

Childhood is a particularly important period for learning about food and nutrition. But the child's diet is practically entirely dependent on what the family eats : it is the family that determines what kind of foods are eaten, how they are prepared, when and how often meals are taken, and conviviality. So although school has a major role to play in changing and teaching eating habits, it can only do so in harmonious, complementary collaboration with family practices.

During schooling, educational programmes on food and diet (knowledge, know-how and knowing how-to-be) must be grounded in a solid understanding of the children's home environment and on the participation of parents, so that there is no gulf between life at school and life at home. School can even afford incitement to change eating habits by proposing other prospects to parents and the community, through the intermediary of children : this is what the notion of upward education is about, and it has been quite successful in Andes.

Food and diet may be a good theme for schoolwork : children take interest in it, and it may be used to teach them all sorts of things (reading, drawing, telling about..., geography, mathematics, history, body expression, etc.), and to put into practice such

values as receptivity, sharing, responsibility, etc. The educational objectives must be clearly defined, and must respect the mental and physical capabilities of the children at each age, and take into account their potential for progress.

Through experimenting for stimulation and for concrete participation, school and the schoolchildren played an important role in improving living conditions in homes and in the community. In this way, school became an integral part of the community, participating in its development and preparing its children to become active members of their social group.

ON MICRO-ENTERPRISES

FROM THE FAMILY SILO... TO THE STORAGE WAREHOUSE*

While the hand-crafted family silo turned out to be the most satisfactory alternative for storing sweet maize, it was not a solution for the hard maize grown on medium-sized farms and destined for sale rather than for home consumption. Family silos do not have a capacity sufficient for the storage of hard maize, and since they would keep the sellers isolated they would not help to improve their community organization or the conditions of commercialization.

Hard maize

Following their work on sweet maize and family silos, the Andes technicians, in conjunction with the San Vicente community, broached the problem of storing hard maize, which had not been viewed as a priority at the start of the project, since this crop is not used for human consumption and the problem exceeds the family framework.

The production of maize for sale encountered two difficulties : first, the fear of losing the year's crop because of certain scourges, and secondly, the intervention of intermediaries, who loaned money to the peasants before and during the harvest period, bringing down the sale price, and thus making considerable profits. Each farm sold its own maize separately.

A community storage warehouse

What should be done ? How could maize commercialization be transformed into an activity that would create community bonds, and into an alternative system in which the peasant producers had leverage for bargaining ? It was at this point that it appeared necessary to create a supply centre, called «community storage warehouse», along with a structure affording a series of technical means which would enable the crop to be sold collectively, in the end.

This system attempts to avoid losses of hard maize caused by insects and various predators, to give families bargaining power and the ability to make profits, which had always been reserved for the middlemen. But it became obvious that the creation of a warehouse was only possible if people united, so as to collect the maize and sell it collectively.

Gradually, the idea progressed ; there were discussions among farmers, those who grew hard maize and those who did not. The community, with its own organization, decided to build a storage warehouse with support from Andes. Since some people were opposed to collective commercialization, a new form of organization arose in which certain hard maize farmers could opt for individual commercialization. Despite it all, a few peasants refused to participate in the project, and it was important to make sure they would not exert any opposition. Once these disagreements had been surmounted, the community decided to launch this activity.

*** by Javier Vásquez, agricultural engineer (Andes)**

Description of the warehouse

The Andes project defined the technical characteristics of the storage warehouse : it would be a concrete building with a cement floor, measuring 152 m² with a capacity of 2,000 bags (in Ecuador, standard bags weigh 50 kg) and the equivalent of 7,000 to 7,500 bags loose. In addition, the floor and walls should provide sufficient protection against moisture, the doors and windows prevent the intrusion of insects from outdoors. Once the maize was stored, a curative treatment with aluminium phosphorus (Gastoxin) would be required to eliminate any prior contamination of the crop (larvae and adults).

The shovels, pick-axes and other tools then went to work, on a steep piece of land donated by one woman, attracting the attention of nearby villagers and passers-by ; forgetful of the hard ground, but aware that every drop of their sweat was bringing them closer to a better life, the population summoned a series of mingas to level the ground, build the lower wall and do some of the excavation needed before the floor could be cemented.

Discouragement

All of a sudden, people ceased to be motivated : the warehouse seemed too large, and they feared that the building did not correspond to their finances and organization. The families found that the work advanced too slowly, for they were anxious to see concrete achievements.

This phase of discouragement led Andes technicians to visit all of the families regularly, house after house, to respond their concerns and re-motivate them, so that they would continue to contribute actively to the construction of their community storage warehouse. Andes changed its timetable, and took the time to await the families' decision. Once the community was motivated again, the department of popular engineering provided support in the form of a student preparing his thesis, who followed the construction work, made a diagnosis and gave the technical suggestions needed for the pursuit of the building process.

The attitude of the president of the community towards this project was another essential element in its implementation, although his presence was problematic for a few families. At the end of each week, in conjunction with the community as a whole, he organized meetings at which the required activities were programmed, and mingas were planned for transporting material such as sand, stones, rubble, wood, etc. The community set up a number of committees, tasks were attributed and agreements made for the participation of families in the day-to-day work. Earlier action was evaluated there, as well.

Financial problems

«How can we get the money needed to cover our expenses ?» This question plagued many villagers, and began to sap their enthusiasm. «Let's organize festivities», suggested one farmer. The benefits went to buy material (cement, wire, nails, a saw, etc.) and to pay a mason.

Community work

Next, the idea of soliciting other institutions was advanced. After much effort, the Ecuadorian army made a contribution, the parish lent vehicles for moving stones. Thanks to the work of the community and to outside help, the community storage warehouse was really coming into existence. A general assembly was organized and was attended by almost all of the families : the objective was to set up a «grand minga» to pour a cement slab. On that October '93 day, no-one should be missing, there was hard work in the offing. After 14 hours of work and a great deal of fatigue, but also pauses to share the food and drink prepared by the women, a feeling of satisfaction after work well done could be seen on the faces of the peasants, along with the desire to see their warehouse function as soon as possible. The families regained confidence, since they could see the fruit of their labour taking shape. Other mingas were organized to do shuttering, raise the walls, do the inner and outer rendering, the pouring of the floor, and to make and place doors and windows.

1994 was a year of great achievements for the community. «The warehouse building must be completed by July, since we must be able to store this year's hard maize crop in our big warehouse, to avoid having it destroyed by weevils and butterflies».

The work done was considerable, and many Ecuadorians and foreigners in official positions came to visit, to learn more about the building project and how it was organized, and there was even a group of French farmers on a study trip. On these occasions, the families offered all of their warmth and hospitality, since for them, receiving people meant not only working together, but sharing values and customs. During the entire construction process, the villagers organized about seventy community mingas, each with the participation of about 15 farmers. During the mingas, the peasants' work force was completed by the use of animals - horses and oxen - for transporting the stones, wood and sand.

Storage

Then came another phase : the organization of the storage warehouse, through an informal community-based system for supplying and commercializing hard maize. A student - a future engineer from the Agricultural Sciences School of the Central University - came to live in the community, and did a study of how the warehouse functioned, for his thesis.

«How will we go about using the storage warehouse ?» asked the peasants. There was a proposal to create the Agro-business Crafts Centre for Supplying and Commercializing Maize, so that all of the members - irrespective of whether they lived in the village or not - would have the same rights and obligations, guaranteed by a legal framework. Once the statutes had been registered with the Ministry of Industry, Trade, Integration and Fishing, a legal adviser defined the legal framework within which the warehouse would function. The cost of these procedures was shouldered by Andes and the community.

But just when the community was preparing to become the legal owner of the land on which the storage warehouse was built, an incident occurred. The person who had donated the land refused to sign the documents, because of personal resentment towards a member of the community ; but finally, the community's right to the land was established.

The Agro-business Crafts Centre for Supplying and Commercializing Maize

As the construction process came to a close, efforts had to be concentrated on seeking means to reinforce social cohesion. After many general assemblies, the constitution of a legal entity through which members could participate individually or collectively was decided.

Legal problems

It was hoped that the School of Agricultural Sciences would participate in the research and development process, through the Cetap, run by agronomy students who wished to prepare their thesis, required for a diploma in agricultural engineering. Several students proposed to work with Andes, but were deterred by the difficulties : this stopped the programme on several occasions. Finally, one student began work with the consent of the community. To be accepted, his thesis plan had to respond to the needs of the families. Those concerned convened and decided to create the Agro-business Crafts Centre for Supplying and Commercializing Maize, and in the presence of a legal assessor, the document officially creating the Centre was signed by the Andes technician, the representative of the Cetap and 17 community members. A new legal entity was being set up, a temporary board of directors was elected and sworn in. The president was mandated to continue the process : one month later the statutes had been approved by the Ministry of Industry, Trade, Integration and Fishing (the Micip) and the organization officially became the Agro-business Crafts Centre for Supplying and Commercializing Maize (Ceproacom in Spanish).

A general assembly then proceeded to name an executive board and a committee was put in charge of negotiating a loan to finance the people's collective cottage industry. The regulations placed emphasis on the membership process : «Prospective members belonging to the community and who participated in the construction process will have the same rights and obligations as the founding members, provided they apply to the committee and pay their dues. Those who did not participate in the work or do not belong to the community must pay a sum equivalent to 50 days of wages on the date of their entry (an average of 50 mingas) and must make a formal request to the assembly». Three new members joined, and there were also some honorary members, including people or institutions in charge of the technical aspects : the Juan César García Institute, the regional head of Andes, the representative of the Cetap and the legal assessor.

The Supply Centre was just about to begin to function when another difficulty arose : the regional Savings and Loans Cooperatives and the National Bank for Development refused to advance the loan needed to put the project into operation unless

all of the beneficiaries had been members for at least three months. This meant waiting until October, then, at which point the crops would have been sold, since the farmers, in need of money as usual in June, would begin to harvest the maize without waiting until it is completely dry, and would sell it immediately at the price offered by the middlemen who held a monopoly on it. The Juan César García Institute therefore consented a loan of 10 million sucres, reimbursable in six months, so that the Ceproacom could get under way that year.

The storage warehouse was able to open its doors during the first days of July 1994, on the basis of previously established technical parameters (see table 1).

Table 1
Technical parameters for the storage warehouse

Factors	Characteristics
Variety	Hard maize
Moisture	14 %
Impurities	2 to 3 %
Price	Market price
Type of storage	Loose
Conservation	Gastoxin

Source : Andes project, 1993.

It seemed important that a villager always be present for the reception and storing of the grain, so the assembly decided to pay someone to do this work. This was the first occasional paid job.

In August, 750 50-lb. bags had been stored, representing a capital of some 12 million sucres. There remained to await the best time for commercialization.

New possibilities were already dawning in the minds of the farmers and technicians, and some new challenges - a shelling machine and a mill - have now been launched.

THE COMMUNITY SHOP*

San José de Saloya is a rural community located in the north-western part of the province of Pichincha, at kilometre 94 of the Quito-Nanegalito-La Concordia road. Its 16 families are organized in a village committee ; most of their subsistence is drawn from day labour, although a few are farmers. The Andes programme in Saloya began in 1988 and ended in 1993. One of the activities, the community shop, was started in 1990.

Dialogue between the community and the Andes team

Contacts with Andes in this village began with health projects in which both the community and professionals invested their energy ; one of the first ones was a diagnosis of the health status of school-age children, in close collaboration with the teacher. This afforded an opportunity to exchange views and to consider the extent to which the different protagonists were willing to participate and involve themselves. These contacts between community leaders and technicians were a starting point for the

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establishment of a profile of the situation as viewed by the community, and of prospects for improving it.

We professionals had differing «social practices» and viewpoints regarding the situations encountered. We introduced ourselves as a group that wished to participate in community development by providing technical support for activities proposed by the community itself. This brought out the different levels of organization of the community, the characteristics of its leadership and the dynamics of power. The community, on the other hand, was able to assess the intentions of the Andes group, its ability to participate and its hierarchy and power structure.

Once the relations were established, the community and the team of technicians trusted each other enough to engage in various activities. The first mark of confidence was the invitation of the Andes professionals to community festivities, and one of them was even asked to be «compadre» (1) when the teacher - a community member whose studies by correspondence had been financed by Andes, so that he could be named elementary schoolmaster - was married.

The community identified the Andes programme as a group of University professors and students who wished to work with the community in a mutually trustful relationship, with action based on a very strong cultural value : reciprocity. This first attempt was successful : evaluation of the nutritional status of schoolchildren took place as programmed by the community and the professionals. Once these bonds of trust had been consolidated, discussions revolved around the ways and means to be utilized in common to find solutions to those problems identified by families as most important.

A number of problems were brought up at the village meetings, including the lack of a school building and of a teacher, the absence of hygiene in children, ascribed to a lack of water, intestinal parasitoses, the fact that bad weather in winter makes it difficult to work full time outdoors on a regular basis, the distance from the health centre and food supply problems.

The solutions to these problems were discussed, and ranked by order of priority and feasibility. Actually, following lengthy discussion, an agreement was reached around several activities that never saw the light, including a community woodworking shop that would provide alternative work for the winter period, but the money required to finance setting it up could not be obtained. The school, training of a teacher, bringing in water and the shop, on the other hand, were successful projects, along with the Pueblo Nuevo health outpost, which was near enough to be accessible to the people of Saloya.

(1) A sort of godfather position offered to someone from the community or an outsider at a marriage or a birth. The person is then a reference for the child or the couple when important decisions must be made, and/or extends help in case of difficulty.

The challenge launched by Andes was to show that community development may be impelled through close, objective technical collaboration. This may modify the history of a community, by helping it to implement sustainable solutions to some of its problems, and not simply solutions that depend on the maintenance of technical support. The idea was to encourage a permanent modification of the social process.

Negotiations around the community shop

Purchasing of food was one of the first problems raised by the community. The prices charged by the Los Bancos shopkeepers and the closing of the Nanegalito-La Concordia road because of the construction of the Quito-Esmeraldas highway made it increasingly difficult to purchase food in San Miguel de los Bancos, and consequently reduced food availability at the family level. The establishment of a community shop was then proposed, so as to avoid shortages within the community as long as travel remained difficult, to maintain prices at the San Miguel de los Bancos level, and to provide work for a local family. This shop was to remain a community business, which might grow and diversify, to finally become a micro-enterprise. It would then be a valuable asset for the further development of San José de Saloya.

The decision to open a shop presupposed the development of the community organization and direct financial investment by the community. Negotiations between the community and Andes led to an agreement to set up a grocery shop on an experimental basis, since neither of the two parties had ever worked in that field. Conversely, previous instances of failures of this type of activity during social development projects had been documented. The improvement of the community organization was a challenge taken on by both partners : the Andes team supported the village of Saloya in its dealings with the Ministry of Social Welfare, thanks to which these only took them six months instead of the usual one-year period.

Organization of the community with a view to creating a shop was predicated on one formal element, the official recognition of the organization, and another, informal one : the reaction of community leaders. A committee registered with the Ministry of Social Welfare already existed in the San José de Saloya area, and this facilitated greater formal participation of the villagers, and made it possible to contact various governmental and non-governmental agencies, to sign agreements and to channel aid.

The community leaders agreed with the members of the village committee, and this was a guarantee of success at the management level : the community focussed all of its energy on the idea of a shop belonging to all, for all. It was in this atmosphere that exchanges took place as to the practical aspects of opening a shop. These were held at the community house, on week-days, with the protagonists suspending their usual work to participate in this collective reflection process.

Towards opening the shop

The first decision involved the management and direction of the shop, which was in the hands of the community committee. This committee delegated responsibility for buying, selling and the accounting work to one family which had previous experience with this type of work and consented to shoulder this responsibility. Furthermore, its house was on a good location, on the roadside, and the grocery could be built alongside it. The father was put in charge of buying and transporting the goods and his wife would do the selling and accountancy, with the help of an agricultural engineer from Andes who would act as assessor and consultant for any difficulties. One year and a half later, this organization continued to be effective.

The shop, built near the family's home, can be watched all the time, and remains open as long as possible. It was built during mingas, with the materials and land contributed by the family that held the concession. The list of goods to be sold was established by the community, and presented during a joint meeting between Andes and the village, at which considerations relative to diet, nutrition, cost and storage were debated at length. The Andes professionals had already discussed the relevance of selling some foods that they viewed as not very healthful. In their opinion, the shop should sell neither nutritionally «empty» foods nor candy, a source of dental carie, nor alcoholic beverages or cigarettes. A model shop game had been designed by the teacher and pupils, in which food was classed according to its role in diet and nutrition. This was one of the educational tools used by the food education programme. Products such as alcohol had been eliminated.

The list of goods

The list recommended by Andes, and which did not receive the consent of the community, eliminated such goods as candy, matches, tobacco, beer and soda, which, although they were not food products, were ordinary household objects in the region and yielded some profit, especially on holidays and weekends. If customers could not find these articles at the local shop, there was the risk that they would go to San Miguel, and would use the opportunity to do the rest of their shopping there. This served as a lesson to Andes professionals, and taught them that there are well-established practices and conceptions within the community that cannot be modified too rapidly, however founded the health or educational arguments advanced. Finally, soda, candy, beer and tobacco were put back on the list of products to be sold at the community shop - and also in the «school shop game», but accompanied by explanations about their role and the dangers entailed by their consumption. Once this final list was established, the first goods were purchased at Santo Domingo de los Colorados, a shopping town located some 100 km from San José de Saloya, since prices were lower there than in Los Bancos or Quito. Amounts were calculated on the basis of daily family consumption, multiplied by the number of families (16) and by 30 days.

A loan

Andes extended financial support in the form of a loan, for which a formal agreement with the village committee was established. The sum loaned was to be used to make the initial purchases, provide the necessary technical assistance and monitor the shop until a commercialization system entirely run by the community could be set up. The agreement also showed the whole process of setting up shop and of community involvement leading to its concretization in the form of this loan. The shop presently functions on a permanent basis and is entirely run by the community.

The community, in return, promised to manage the shop in such a way as to meet the needs of its members, with a set schedule, from Monday to Sunday. Goods to refill the shop were to be purchased through the sales income and the profits made. The wages of the woman who runs the shop and the cost of transportation were to be covered in the same way.

How it works

There was so much business at first that by the end of the first week the staple goods were already sold out, since families had bought a month's worth instead of a supply for a few days, as expected. It must be said that there was no road at the time, so that it was difficult to travel, and prices were high in Los Bancos. Another phenomenon that had not occurred to anyone was that families, especially those with low incomes bought on credit. And so, suddenly the shop was empty and moneyless. The community solved the problem by making an effort to pay rapidly, more goods were purchased, and sales could go on. An even course was soon reached, and this problem no longer exists.

Emphasis should be placed on the fact that the text of the agreement contains a written summary of the process engaged in by the community and Andes up to the opening of the shop. It would perhaps have been difficult to ensure the success of this action if an agreement specifying the action to be taken had been drawn up in advance and signed at the outset. Such an agreement might not have corresponded to the economic and social realities. And yet, this is the most common practice, and one that pushes this type of experiment towards failure. Some official in an office, a stranger to the community, writes up an agreement and the community accepts and signs it in the hopes of receiving aid. The difficulties begin shortly thereafter, and lead to failure.

It seems that when the basis of the agreement signed is the accomplishment of decisions already made, there is some guarantee that the engagements will be respected and the resulting activities will be developed. Despite this, and with the consent of the community, the opening of the shop was initially delayed by five months, and the final delay was 10 months, since discussions over certain decisions, and various checks on the cost of goods, took a long time.

Evaluation

After 9 months of operation, the following difficulties were diagnosed by the first evaluation. First of all, the originally planned investment turned out to be too small in regard to the food needs of families. Secondly, the shop was in competition with those in Los Bancos, to its detriment, probably because of the small amounts purchased. It was unable to maintain the pace of the first week over a long period of time and did not set up an effective credit system that would have enabled it to rely on two types of «capital»: one for the first purchase and another for the second one. As an outcome, several families continued to buy on credit in the San Miguel de los Bancos shops, where the system already functioned quite well, for the greater profit of the shopkeeper !

The positive aspects included the fact that buying and selling through the community shop continued on a regular basis, and apparently no financial losses were incurred during the various transactions : once the accounting was balanced out for the first months, it was clear that purchases had increased because more money was available. The family in charge of the shop had taken some initiatives such as asking suppliers to leave their goods at the end of the road under construction. At the initiative of the community, the shop was enlarged, and diversified its activities by opening a distribution centre for gas for domestic use. All of the communities living above San José de Saloya can now do their shopping there, thus economizing a walk of about 10 km. This initiative functions perfectly, despite competition from the Los Bancos delivery lorry, which has the disadvantage of doing its rounds on set days.

In the process described above, the co-participation of Saloya and Andes is a salient point ; the inhabitants of the former, with their leaders, did community-type work and took initiatives that furthered their development ; the latter learned to work within a pluridisciplinary team on a grassroots project : the shop. They were witnesses and actors in interrelations between two groups belonging to different cultures and motivated by a shared developmental objective.

All of this represents the first step in the experience. The parties involved moved along the same path at the same pace, the outcome being the agreements signed and the activities achieved. This also incited some families to suggest innovations, thus indicating the quality of the ties.

The relations then entered a phase in which the contrasting interests of the parties involved were decisive : on the one hand, the community strove to increase the amount of credit so as to obtain larger quantities of goods, whereas Andes, on the other, had planned to diversify the shop's stocks with products of animal origin.

Another cycle of discussions

Another series of discussions with the community was begun. The population felt that the sale of meat products could be put

off to a later date. It was important to turn the shop into an invaluable centre supplying the local communities, taking advantage of the lack of a road for motor vehicles. Consequently, the money that Andes intended to lend for the opening of a counter selling goods of animal origin was to go to increasing the amounts of those goods already on sale at the time.

In the long term, for Andes and the community, the objective was to increase the financial capacity of the shop, but the two partners could not reach an agreement on what to sell, on the importance of certain increments or on how to plan this undertaking. Such contradictions definitely should not be feared, since differences of opinion between groups and individuals working together are a source of progress, and contrary to appearances, a total agreement imposed on those involved leads to failure and breaches of contract. In this case, another loan was extended to the shop : it constituted a positive response to a demand coming from the community.

One important point in the «Andes-community» agreement concerns the loan : loans to be reimbursed in non-set instalments are a way of encouraging rural communities to take productive initiatives. Opinions to the contrary contend that communities must launch their undertakings with their own resources. It must be admitted that the question of the loan was raised when the programme was already in full swing, and since Andes had not yet set down strict rules it confined itself to reproducing the practices of the social department of the administration : that is, to consent loans with periods of respite for reimbursement, but it also decided not to demand interest. From an economist's viewpoint, this may seem heresy, but it was felt that this was a way of «sowing» development. The Andes funds - small, in truth - came from a programme financed by an international foundation.

At this point, it was not yet possible to establish a link between the financial benefits of the micro-enterprise and the nutritional benefits that were the objective of the San José de Saloya programme. One thing is sure, the shop functions and no-one imagines that it will close. It grows bigger as days go by, and the community as well as the family in charge continue their work. The community is satisfied with the presence of the shop, and makes use of its commodities. Isn't that in itself a satisfying experience ?

THE PIGSTY*

*** by Dr. Fernando Salazar (Andes, Juan César García Institute)**

In the town of Pueblo Nuevo, a community micro-enterprise called the community pigsty was set up. There was a cheese factory, run by an association of families producing cow's milk, yielding about 500 litres of whey that went unused. A number of proposals had been made to avoid this wasteful situation. Since the community was located on the road under construction that

would link Quito to the Pacific coast, a pork-meat production programme was chosen. Studies showed the existence of a potential market for a number of products : pork-meat products, head cheese, fresh meat, fried skin, etc. The idea was to buy young pigs and fatten them rather than to start with a sow giving piglets.

Many issues arose around the setting up of a new community micro-enterprise in this village. Should it be a branch of the cheese factory and belong to it, or should it be independent ? Should it group the same families, only a few of them, or accept new ones ? Should the pigsty be organized along the same lines as the cheese factory, or develop other alternatives ? These questions were examined by the members of the community and the technicians at the fist joint meetings, and the pros and cons of each solution were debated.

A community micro-enterprise

It was finally decided that the pigsty would be a community micro-enterprise open to all members of the community, irrespective of whether or not they participated in the cheese factory, and that families could ask to join it at any point, as the programme went along, but provided they met a number of previously defined requirements. The cheese factory experience was to serve as a basis for starting the pigsty venture. On the administrative level, it was decided that the pigsty should be given a legal status in which the community and Andes were both partners, so as to obtain government aids more easily, and increase the bargaining capacity.

Building the pigsty

The association of cheese factory members decided on its own initiative to donate a piece of land and to request that it be given full-fledged membership. Andes and the community drew up the following agreement : Andes promised to have the plans drawn ; the community promised to supply local materials such as stones, sand and wood ; Andes promised to finance the purchasing of cement, bricks, etc, and to provide technical supervision for the construction process. The community was in charge of providing the labour force.

The work began on this basis, with the participation of the community and Andes ; mingas were organized to haul the material to the site ; two masons provided by the provincial authorities went to work on the foundations, on the basis of a plan drawn up by a student at the Central University engineering school. Although the masons were experienced, they committed several errors in interpreting the plans, and the work had to be interrupted in spite of the community's desire to have the building completed as rapidly as possible.

Andes then contacted another engineer who agreed to take over where the work had been left off. His idea was to supervise the building of the pigsty, and at the same time to conduct a study, for his thesis, on the best way to handle the waste products

produced by it. He wished to experiment with a biodigester, a system for processing the liquid manure and liquid waste to avoid contaminating the soil and waterways. This professional was soon integrated and became a leader of the group working on the pigsty project. To lower the cost of the construction, he suggested a rather revolutionary building technique involving the use of bamboo stalks to replace the iron bars in the reinforced cement holding up the roof and frame. Once dried, the bamboo stalks are pierced by large screws to increase their resistance and enable the cement to adhere to them. This alternative, invented by the school of engineering, has two advantages : the first is its resistance to earthquakes, the second is that it is more economical.

The community was somewhat reticent about the technician's proposal, since it feared that the bamboo would rot and the building would be less sturdy. Following several meetings at which these fears were expressed and explanations given, the community accepted the proposal and acknowledged its technical and financial value.

The building process lasted about a year, and the biodigester was also set up during that period. It is a fact that the liquid waste and excrements from the pigsty and cheese factory are both rich in organic substances and highly contaminating, and cannot be allowed to run into the neighbouring stream. Furthermore, the residual sludge from the biodigester is a high-quality fertilizer, rich in nitrogen and good for use in vegetable gardens.

How it works

Once the building process was over, the functioning had to be defined in detail : water, a fundamental element here, turned out to be a limiting factor. This situation forced the entire community to look for a solution, and once again the participation of the young technician was extremely valuable. Negotiations were engaged between Andes and the community in order to improve the amount of «reliable» water available. Again, as it had for the pigsty, the community supplied the locally available material and the manpower, while Andes supplied the other material and took charge of the technical supervision.

Once the pigsty facilities were completed, the «reliable» water was brought in and the biodigester was ready to work, the next step was for the families to buy some young pigs in order to produce meat rapidly. But it seemed that the organizational and commercial aspects had been neglected : it was as if building the pigsty and installing the biodigester had taken up all of the attention, energy and time of the families. It was difficult, then, to convince them of the absolute necessity of conducting two feasibility studies : one investigating how to obtain feed for fattening the pigs, the other on the sales networks. The peasants in charge of the pig-raising project were able to visit

several other enterprises of the same type so as to analyse the meat-producing and commercialization processes.

Feeding the pigs

Feed for the pigs is an all-important factor, and may represent up to 85 % of the production costs : one of the positive aspects of the project is the availability, every day, of about 500 litres of whey, a by-product of the cheese factory, thus considerably reducing the need for other food normally required for such a project. Furthermore, there is a local production of taro (colocasia esculente), a root that may be considered another important food contribution.

Sales networks

An engineer from the higher polytechnic school is now analysing the market, to determine how to best commercialize the product. The new road between Quito and the Pacific coast takes tourists to the beaches, but also opens access to Colombia. Travellers stop at the village shop, where cheese and other goods are on sale. It will be easy to sell pork-meat products. Moreover, San Miguel de los Bancos, the county town located 13 km away, is also a potential outlet, since it is a large shopping centre.

Conclusion

The Pueblo Nuevo community now seems to be sufficiently dynamic to be able to develop other micro-enterprises on its own. Following the increased milk production, achieved through improvement of pasture land and efforts to improve the health of its cows, the village was able to intensify and diversify its production of cheese and dairy products. It has now taken advantage of its whey to set up a pigsty and visualize the commercialization of pork-meat products. The biodigester is instrumental in protecting the environment and in transforming the liquid manure into sludge for use as fertilizer, and water that can return to the river without polluting it. The fertilizer, presently used in family vegetable gardens, will perhaps be useful in developing other activities in the future. The crucial point for this community is still its social organization : whenever undertaking any activity, it is important to make sure that all families are informed, so that they may express their opinion and be integrated in the project at any point in the process, on the basis of clearly defined prerequisites.

FROM COMMUNITIES... TO THE UNIVERSITY*

TRAINING IN FOOD AND DIET

From the outset, one of the main priorities of Andes was to translate the positive results of its work in the village community into elements for improving training courses for executives and future professionals to be working in food and diet-related programmes. These changes were to be introduced in the curriculum dealing directly with food and nutrition, but also in teaching methods and field internships. At the start, reflection on this theme was confined to the medical school courses of the different members of both the health and agricultural engineering school teams. Then, gradually, the lessons of the Andes programme became evident : a separate university-level training programme was needed, with a comprehensive approach to food, diet and nutrition problems within a two-year cycle open to professionals from various schools.

The school of medical sciences

Contents of the programme

As Andes continued to develop, improvements were introduced in the training programme for medical students in each year of their studies : the educational objectives with respect to food, diet and nutrition were reformulated, with a more comprehensive approach based on the everyday experience of families. The presence of teachers in this field who were also active members of Andes facilitated this process. The main idea was not to reduce nutrition to its medical and pathological aspects, but to give students the basics required in order to analyse the food intake of families : food and its nutritive value, but also cultural representations, behaviour and dietary intakes, approaches to nutritional status and consumption, behaviour with respect to consumption, evolution of practices and food preparations, information about the food and agricultural situation of the country and availability of food to feed the population, not to mention the economics of food and diet, at both the national and household levels (figure 10).

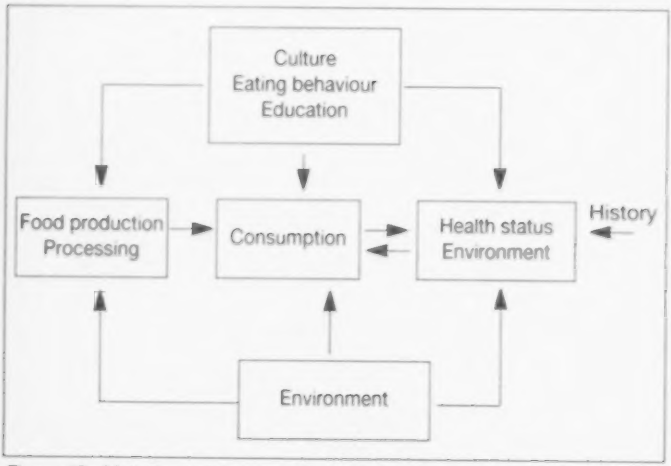

Figure 10 : Main lines of the master's degree programme.

*** by Dr. Anne-Marie Masse-Raimbault, Dr. Michel Chauliac, Pascale Gerbouin-Rerolle (ICC)**

Internships in health centres

The knowledge vehicled by these programmes was not the only thing overhauled : the know-how, knowing how-to-be and knowing how-to-communicate were also overhauled. There was no question of listening and more or less passively receiving notions pertaining to the analysis of the dietary and nutrition-related situation of individuals and groups and to how to solve these problems. Concrete participation in the everyday situation was required. On the basis of this principle, the school agreed to change the rotating internship programme (an internship done by all medical, nursing or midwifery students during their last year of studies, in a district or provincial hospital) into a 10-week internship in a health centre. This formula was first experimented in the areas where Andes was working ; the students were taken in, they lived and worked with the pluridisciplinary team and participated in activities within the communities. This attempt, although difficult to set up for logistic reasons, turned out to be fruitful, and enabled the students to familiarize themselves with comprehensive and family health activities. On the whole, they were satisfied, provided they were given supervision and allowed to participate in meetings in which a question/answer system helped them to formulate and solve their problems. This internship outside of the hospital was subsequently generalized and now enables students to prepare for and make the best of their final-year rural stay.

The school of agricultural sciences

The school of agricultural sciences introduced a compulsory senior year seminar lasting about one hundred hours and dealing with the various aspects of food, diet and human nutrition.

THE MASTER'S DEGREE IN FOOD, DIET AND NUTRITION

The difficulties, failures and successes encountered by the Andes professionals, along with national and international thinking about food and diet policies, gradually pointed out the needs and required aptitudes and attitudes of future officials. Once the essential knowledge and skills had been inventoried, a training programme was gradually designed and discussed both by the country's specialists, in the ministries, in some non-governmental organizations and in various schools within the central Quito university, and elsewhere, especially in agencies such as FAO, PHO, Incap (Nutrition Institute of Central America and Panama) and among researchers in South American countries.

The profile of students

Through these numerous exchanges, the type of specialists needed by governments and international agencies in order to design policies in the field of food, diet and nutrition, elaborate and lead activities programmes, participate in research and training in universities and institutes, evaluate the relevance of some of the projects proposed to countries by outside agencies, etc, gradually became clear.

The university framework

At the same time, there was a need to define the university framework in which training of this type could be developed and lead to a nationally and perhaps even internationally recognized diploma. The concept of pluridisciplinarity had to be materialized in the programme, the type of participants and of teachers ; the

project therefore had to involve the university as a whole and not any single school. The designers then began to approach the rectorate and the university council, so as to propagate this idea of pluridisciplinarity, which, in this case, meant decompartmentalization. Despite the sensitization efforts undertaken at this level by the Andes officials from the start, the negotiations were long, especially with the administration, since there was no previous experience of this type : the structure therefore had to be created and integrated in the existing legal framework. This was not easy, but thanks to widespread interest and the tenacity of the Andes officials, the master's degree in food, diet and nutrition, supervised by the schools of agricultural and medical sciences, was set up and a third-cycle diploma recognized by all schools of higher education was obtained.

The curriculum

The first class began to function in January 1993, with 19 participants : physicians, nutritionists, agronomists, nurses, midwives and food/agricultural engineers, 14 of whom were Ecuadorians, and 5 from other countries on the continent (Honduras, Nicaragua, Colombia and Mexico). An entrance examination, for which there were 53 participants, selected candidates for the master's programme. The two-year full-time training programme was organized in 7 modules lasting 80 to 240 hours. The themes were food and nutrition security, notions of epidemiology, applied statistics and computer science, administration and management of programmes, research methodology, education and social communication and last, social organization and participation. The second year was almost exclusively devoted to the production of a thesis by pluridisciplinary teams of 2 to 4 students. The thesis subjects were to be chosen in accordance with needs and lead to proposals of programme/solutions. The educational technique used was mainly based on case studies and personal and group work. In early 1995, once the teams had passed their thesis, all of the students found work in various agencies, mostly in ministries and institutes. Following evaluation both of the programme and the educational methods, another class should begin in 1996, hopefully including students in economy and the social sciences, so as to enlarge the scope of the pluridisciplinarity.

THE CENTRE FOR THE STUDY OF APPROPRIATE POST-HARVEST TECHNOLOGY

This centre for appropriate technology (Cetap) was created in the wake of the activities impelled by Andes and by certain communities in order to develop and support action-research relative to storage, conservation, processing, commercialization and consumption of food products, as well as the management and administration of such programmes. This structure is part of the school of agricultural sciences, works in close coordination with various national and international institutions, and is gradually taking responsibility for training professionals and community leaders. Its action-research is formulated on the basis of questions coming in from the field, and touches on the various stages in the food chain comprised between harvesting and consumption.

Through it, students find locations for writing their thesis. The seminar on food, diet and nutrition problems, now a part of the agricultural school curriculum, helps to arouse students' interest in this type of approach, and incites them to choose subjects in this field. The centre is located in one of the agricultural school's experimental farms ; it coordinates grassroots action, and more specifically in the region covered by Andes, in the field of dairy processing and the conservation of maize. In the future, the Cetap may develop other sectors, such as the production of foods specially adapted to the requirements and digestive capacities of small children, and manufactured in semi-cottage industry fashion using locally available produce. It is clearly stipulated that the Cetap will pursue its pluridisciplinary work on these subjects, transcending the strictly technological approach.

THE CENTRE FOR NUTRITION, GROWTH AND DEVELOPMENT

This centre, set up within the school of medical sciences, also has a pluridisciplinary vocation : it is an action-research unit concerned with the evolution of human diet and nutrition, and more particularly that of women and children. Another objective is the promotion of more appropriate teaching, closer to the reality of family consumption and the nutritional status of the population, participation in the coordination, at the national level, of university action, and involvement in the effort to inform and educate people about food and diet through all existing channels. It aims at becoming a reference and expertise centre for the ministry of health, in a prospective optic. This plan for action should be developed in collaboration with national and international agencies, and encourage alliances among them. This is another way to «contaminate» university professors, and to advance and propagate the main principles of Andes.

These three new activities, at the national level, correspond to Andes' initial objective with respect to the training of executives. In the longer term, its ambition is to participate in the multiplication of teams of specialists who agree with the underlying options of Andes are capable of putting these into practice and inducing extensive change in food policies, be it in Ecuador - the country in which the former master's students are now working - or at the international level.

SOME REMARKS*

In the course of the Andes programme, many clarification and evaluation meetings enabled the Ecuadorian and French teams to conceptualize the methodological research and strategies developed with both the peasant communities and the ministerial and university officials. Confrontations between the different approaches and perceptions led to advances and deeper theoretical and strategic insights on how to improve food, diet and living conditions, and enable the least advantaged individuals and families to develop, progress and achieve not only freedom and autonomy, but also integration in the socioeconomic evolution of the present-day world without losing their identity.

This reflection/synthesis phase is essential for the propagation of the methods experimented in Andes and the exponential xyz multiplication of innovations throughout Ecuador and in other countries. Such transfers must of course be the object of active reappropriation by those involved, since there can be no simple reproduction of approaches or operations conducted elsewhere in other cultural and economic contexts and grounded in other social logics and dynamics.

The central focus of Andes was improvement of family diet. To achieve this objective, the strategy chosen was to count above all on peasant participation, with the support not only of health officials - as had been attempted over and over again, more or less successfully - but above all of specialists from other fields such as education, food/agriculture, economics, social anthropology and sanitation engineering. Several axes were thoroughly explored along the way, including family consumption and pluridisciplinary work, social organization and, in the last analysis, the process of change.

CONSUMPTION

The notion of food consumption was gradually clarified during the Andes programme and in exchanges with other teams. Finally, the need was felt to go beyond the analysis of intakes and of individual nutritional status, household consumption and societal eating habits, to consider the influence of the family, culture, social group and state policies. It was also clear that this system was dynamic and susceptible of changing, sometimes rapidly.

Food consumption is therefore an evolutionary «total social fact», affecting all sectors of societal life, be they technical, biological, economic or sociocultural. For this reason, the nutrition-related and/or economic approach is seen to be inadequate, and there is a definite need to view consumption differently, considering at least four other components : ways of obtaining food, ways of preparing food, eating habits (structure and frequency of meals, conviviality and table manners) and individual behaviour ; the latter includes some previously investigated aspects such as representations of different foods, motivations and felt needs. The work should be done in pluridisciplinary teams, but also should respect the different levels, since some processes pertain to

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individuals, others to the household or family, and others to society at large.

Eating styles

The approach known as the «eating style approach» yielded a dynamic, comprehensive vision of the food consumption of individuals within their community, but also improved understanding of the evolution of behaviour in the face of some outside events such as migration, urbanization, financial problems, etc. Consumption is conditioned by a number of factors, and not only by the characteristics of production : it has its own structure and specific type of functioning, through which it interacts with the food and diet system as a whole. Consumers are active, creative actors who adjust their eating styles on the basis of acquired notions, and innovate in accordance with the demands and resources of their environment. Figure 11 attempts to present an overview of this concept of eating styles, which generates a different, more comprehensive approach to food consumption at the family and individual levels.

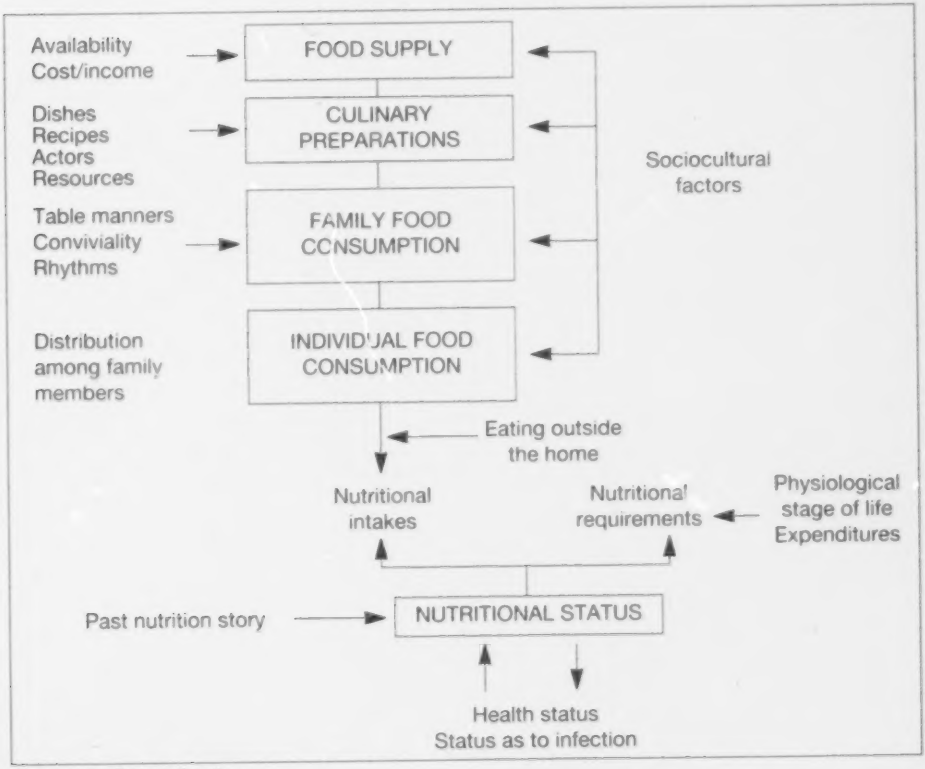

Figure 11 : Styles of eating.

PLURIDISCIPLINARITY

Consumption, the unifying theme for pluridisciplinarity

The method for getting to know the eating styles of a population necessarily entails work in a pluridisciplinary team, given the variety of sciences involved, the multiplicity of situations and the different levels of influence, if both the local level (called the micro level) and the national (or macro) level are to be considered. At the start of the Andes programme, consumption had already been defined as the sector unifying the various disciplines, since it required team work among professionals who would pool their varied competences, knowledge and know-how to gain a more complete, finer understanding of this complex system, in conjunction with the population. It seemed to be the ideal experimentation system for pluridisciplinarity, both at the grassroots level and in the university training programme.

Discipline... knowledge and know-how

Quite often, pluri-, multi- and inter-disciplinarity are used as interchangeable terms ; some distinctions are called for, however. A discipline corresponds to a field of knowledge such as the science of health, agricultural, education, sanitation engineering, sociology or law, to take those that came into play in Andes. Each discipline taught in a university covers specific knowledge and know-how : it will enable professionals to perceive a certain aspect of reality, which reality has many facets. It is necessary to multiply the approaches, then, to apprehend reality in its totality.

Discipline... and method of analysis...

Each specialty has its method for approaching problems, and transmits it through specific teaching programmes. It is probably during this phase that the origins of the difficulties encountered by specialists in different disciplines in working together are located : a way of thinking, looking and analysing is implicitly inculcated during the study period, with no reference to other types of approaches. Now, there are limits to the diagnostic capacity of each specialty. Complementarity may be attained, but when it is not learned this may be an obstacle during the first attempts to collaborate with professionals in other disciplines. Complementarity only becomes a source of enrichment when it is open and explicit. Difficulties even arise at the vocabulary level,

... and vocabulary

since the same words do not cover the same realities. Mutual comprehension, the harmonization of vocabulary and sharing of the various modes of analysis constitute a long-term undertaking : one that would be facilitated by a change in university training programmes so as to habituate students to working with complementary disciplines.

Within a same discipline, professionals take on a number of tasks, corresponding to different statuses, in which the extent of their knowledge makes them complementary : such is the case of doctors, nurses and midwives, or in the field of agronomy, of agricultural engineers and technicians. It is true that when the degree of responsibility differs, the notion of status is often amplified by the social context.

Pluridisciplinarity and complementarity

Pluridisciplinarity (or multidisciplinarity) was engaged in by Andes when a problem was analysed and solutions sought jointly by the people in charge of different disciplines and the peasants. For

instance, when people expressed their desire to have larger amounts of water, and to bring it closer to their homes, the health team, the agronomist and the teacher analysed the problem with the families and children, explored the advantages and difficulties, and began to design a work programme. Their skills, although quite varied, soon turned out to be insufficient, and they asked for help from sanitation engineers in harnessing and piping in the water, controlling its quality and determining its distribution, and later on for maintenance and the follow-up of the equipment. A jurist came and contributed his knowledge about land ownership and the legal questions involved in relations with the national authorities. All helped the communities to organize and allocate work, and most of all they contributed their competences, facilitated decision-making and helped to find solutions to interpersonal problems and blocked situations. The basic idea was to have the projects and the community organization advance hand in hand, and not to import a predetermined organizational model.

Pluridisciplinarity and administrative difficulties

For the communities themselves, pluridisciplinary work does not raise any insurmountable problem. When faced with their own concrete reality, people never think in terms of disciplines : peasants start with problems requiring solutions, and improvements to be introduced in their everyday life, and go from there to planning, by a team (the team being composed of villagers and professionals), of action following diagnosis and decisions as to priorities. Pluridisciplinary work then becomes a necessity for those in charge, since it is indispensable and corresponds to needs. But difficulties arise later on, since each professional working in direct contact with the population is attached to an administrative sector which not only pays him/her, but hands down action programmes and directions for functioning that are not always in close consonance with the desires of the population. It then becomes difficult for the specialist to respond to these diverging solicitations. Difficulties are further compounded by the problem of budget allocations.

This situation became quite clear for the people in charge of the health sector of Andes : the professionals in the centres depended on the ministry, which sent out guidelines for action and evaluators. The population living near the centre did not understand why the personnel should leave their work to travel to outlying communities belonging to the same administrative sector. Furthermore, the Andes programme focussed mainly on prevention and education, involving work with each family in the village, and going beyond the curative and strictly individual approach.

Letting time do its work

Conversely, the Andes agricultural engineers were attached to the programme only, since there was practically no popular farming structure in the area. These differences of organization pointed up the advantages and disadvantages of each situation. In the health field, activities unfolded more slowly, by trial and error, but thanks

to this it was possible to gradually discover how the notions experimented in Andes could be integrated in the national university or ministerial programmes. Negotiation played a major role at that point. With the agronomy sector, grassroots activities could be implemented more easily, rapidly, and above all in agreement with the demands of the communities. But when the time came to translate certain actions in terms of national structures, hesitation - and sometimes even resistance to change - was greater, since the all-important phase of gradual sensitization facilitating transformation had not taken place. Once again, time had not been allowed to do its work.

Pluridisciplinarity is more than technological complementarity

In our opinion, one may speak of pluri or multidisciplinarity when different disciplines converge on a concrete subject to analyse, exchange and discuss their respective findings and then to work together to find and develop solutions : each discipline contributes its competence, but this means that the various actors have reached an agreement on the concepts and vocabulary used. Pluridisciplinarity does not simply mean making a given technology available for a project, but more importantly, bringing the different types of knowledge, know-how and knowing how-to-be face to face so as to arrive at an operational complementarity and a comprehensive approach to the subject broached, one that is as close as possible to the reality of the local situation, and respects its numerous facets. Above all, pluridisciplinarity, which demands that specialists all know and acknowledge the competences and specificities of each of the other specialties, and unhesitatingly call on them, should not be confused with polyvalence, where people believe that they can replace specialists in other fields, and thus impoverish all of the disciplines. Herein resides the enriching nature of pluridisciplinarity.

The notion of interdisciplinarity has not been discussed here : after many exchanges of views it was found to be most interesting, ideologically speaking, but quite difficult, if not impossible, to apply in practice because of the top-down organization of sectors. Interdisciplinarity would require the existence of true intersectorial organization at all echelons, and this would imply a completely different central organization. Perhaps this approach should be kept in mind, so that mentalities and structures may gradually change to the point where another type of functioning will be possible.

SOCIAL ORGANIZATION

From the start of Andes, the people in charge attached great importance to the concept of social organization. One of the central points of the programme was to induce the dynamics of developmentally-oriented initiative with the participation and under the control of the peasant communities. This process was to be accompanied by the professionals, who would extend their technical assistance and help in negotiating. This was part of a moderately long-term objective of making communities autonomous, capable of managing change and chosen innovation

on their own, so that they could take charge of themselves and rid themselves of their submissive, fatalistic attitudes.

The aim was to restore these communities' faith in their value, so that they could raise their heads and no longer live in withdrawal, to give them self-confidence so that they could establish links and begin to dialogue with the outside world that dominates them. It was out of the question to propose change for the sake of change, but rather, change in order to improve the living conditions of these village communities so that they would gradually find their own place in development, and live well, in their own specific way.

Andes, priority to collective action

To propose a programme of this kind meant that everything would rest on collective action, and implied that the professionals, but also the communities themselves understand the social organization of these communities. This was one of the main axes, and surely the most difficult one. During the various phases, emphasis was placed on pointing up peasant knowledge and skills, to valorize them without indulging in demagogy, but social organization is much more complex.

Social organization, a dynamic process

First of all, social organization is a dynamic process : it gives meaning to community life, which is composed of structured social relations, relatively stable over time and imbued with cultural notions. These relations are expressed through collective action, most often repetitive, in which values symbols, ideas, beliefs, paces, roles, tasks, etc. are shared by all participants. It is the behaviour of villagers during farming, family, religious and festive activities, or when faced with events such as sickness, death or an external threat that constitutes this culture, composed of models and patterns built up over the years through mutuality ; it repeats itself, but may also change through various influences or by borrowing from other cultures.

Social values

It is these cultural ideas that the Andes team attempted to discover through the behaviour of each community. The first step was to try to identify social values ; that is, what the different members agree to view as good or bad, important or insignificant. These social values are not the same thing as individual values.

Social patterns

The next step was to discover social patterns, to see what peasants may or may not undertake in the way of action : these are regulated by norms, moral obligations and social rules. Next, some notions about human beings, their life, origins and future are part of this heritage and occupy an important position in this culture, especially when it is confronted with some educational, health and other programmes. These beliefs do not necessarily seem to be extremely logical or scientifically right, but they exist and may be extremely influential, and in no case can they be overlooked or transgressed.

Last, this social organization functions, and it is important to perceive the process, which is dynamic but sometimes is somewhat slow and out of phase with technological innovations,

the local socioeconomic situation and development-oriented activities. When introducing technological innovations aimed at improving living conditions or food consumption, the question of their effect on the thinking and culture of these communities must be raised. The danger is considerable here, with the risk that an imbalance may be created if the social organization changes in only a few respects, and a loss of community cohesion may ensue, owing to the slowness of the process.

Despite all of the efforts of the Andes group and its proclaimed will to strengthen these systems of social organization, this remained a subject of insatisfaction ; perhaps less so for the grassroots professionals than for those who had hoped to arrive at a degree of conceptualization and to be able to propose a methodology.

Communities are not homogeneous

The Andes leaders definitely came to realize that there is no model community with its social organization, but rather, a great variety of communities which are far from homogeneous ! The two areas, for instance, are very different in character : the San Miguel area, peopled by immigrant families coming from different places is more heterogeneous and less structured, perhaps easier to approach, whereas the San José area, composed of natives, is more traditional and the social organization is difficult to perceive in everyday activities. Further, these social relations, developed over time, afford security to community members, who then tend to fear change ; they have lost their individual autonomy while accruing security, strength and power through structured action developing within the social group. Sometimes, when the administration forces new structures on them as on the rest of the province, the villages cleverly seem to play the game, they submit to this intrusion, view it as a necessary evil, but do not integrate these changes in their cultural system : this is their unconscious way of resisting.

The place of festivities in social relations

An essential element in work with these communities is time, allowing time to act : being able to leave a programme in suspense for one or two months or more, rather than forcing people who are not convinced, or acting in their stead. This notion of time, so different from what it is in western societies, was constantly found to be present here. Of all the rites encountered in these communities, the festivity is what we saw as embodying most of the human values, and occupying a foremost place in social relations. How much time and energy are devoted to maintaining these bonds ! At first, we were struck by the importance attributed to festivities, then we realized that they meant trust and friendship, in particular, and tried to take advantage of them to enrich communication and understanding.

Conflicts and crises, sources of progress

From the start, the strategy was clearly to rely on social organization, but in the course of the programme, two conflicting positions were often defended by members of the pilot team. For some people, the social organization that was expressed by the group's agreement on a same objective was definitely the lever, the tool to which Andes should give priority, and all of the

decisions and activities were in the hands of the villages, which were the actors and object of development. The others viewed social organization as an aim in itself, the objective being to fortify it so that the communities would become more demanding, capable of having their rights respected at the provincial level, and of undertaking action on its own. Andes, through its activities, was to be a tool for the reinforcement of this social organization which was in fact the priority. These political disagreements within the pilot team sometimes slowed down the work, but when conflicts and crises are handled properly, they are a source of progress.

The leaders,

Andes relied a great deal on what people usually call leaders. The word is not very appropriate, since these men and women shouldered a variety of responsibilities and expressed their influence in very different ways. Many of them were not the spokespeople of the community, the vectors of information, the people who entertain relations with the outside world because they have a well-known ability to communicate, or those who know how to bring all of the families together around an issue under discussion. There are leaders who are invisible, so to speak, to the visitor : reference people, whose advice is sought before making a decision, people to whom one may turn, depending on one's age and sex and the type of problem. There are village heads, but other prominent people gravitate around them and are recognized for their skills, experience, merit or age. These bonds and relationships are extremely complex, and must be gradually unravelled, since action is not the outcome of relations between two individuals, in these communities, but of membership in that particular community.

... spokespeople

... reference people

... respected people

One may wonder : up to what point do leaders express the wishes of their community ? Isn't there a point at which they speak in their own name, and defend their own interests, leading the village into action which, although not harmful, is not at all desired by the majority ? Don't leaders give the impression they have changed sides, after awhile ? Is this a sign of progress ?

Learning to negotiate

In this work with various community organizations, learning to negotiate was an important factor. The same is in fact true for relations with the national agencies and with various institutions. It was all-important to respect local culture and competences, to obtain and understand the views of each actor, to refrain from exerting one's power, to seek a form of consensus and cooperation which was neither paternalistic nor dominating. However, it was also important to keep on the course that would allow each individual to find his/her place in development. These attitudes, that served as guidelines throughout the programme, could only be effective inasmuch as the pilot team knew where it was going and what was negotiable, but remained staunch about certain basic values.

The sense of equity

A last point should be emphasized, concerning work with the families. It was decided, from the outset, that priority would be given to the most impoverished families, even if this was difficult. It

soon became clear that the most disadvantaged were also the slowest to move, the most distrustful of innovations, even those decided by the majority. It was out of the question for Andes to forcibly enrol these families in action. They had to maintain their freedom to participate or not in a programme, and had to formally apply for membership. Andes did not attempt to have all families in a community participate in any one concrete action, at any given time, except if a collective agreement turned out to be necessary for it to take place, as was the case for piping water in. Andes attempted to apply a certain spirit of equity, by respecting two principles : making sure that all families, with no exceptions, had received and understood the information on which to base their decision, and make sure that within the protocol of an action, or the statutes of a micro-enterprise, it was clearly stipulated that any family could enter the programme at a later date if it so desired. This means that at the start, the information supplied gave all of the families an equal chance, and they had complete freedom to deal with the question of participation at their own pace, in their own way. It is important not to damage the community's social organization, which should continue the process of structuration and reinforcement.

THE PROCESS OF CHANGE

In the last analysis, Andes promoted many processes of change at all levels, in the various sectors in which it came to work, but also in the ways of thinking and attitudes of both professionals and families. This change in attitude of all of the actors was expressed concretely in the comprehensive approach to problems relating to the living conditions and diet of the population. It was facilitated by pluridisciplinarity, the sense of equity and respect for the families, and the deliberate attempt to promote a degree of autonomy. There was no longer any question of exerting power through vertical, domineering or paternalistic relations under the pretext of providing assistance or protection, but rather, another form of cooperation gave the people involved the possibility to decide and act with support from professionals.

Change was visible in the perception of nutritional status and food consumption, and consequently, in the solutions for improving it and the training programmes.

Planning programmes step by step

Change involved the way the developmental programme was designed. It was not planned in advance, with only a few openings for the participation of the villagers. At the start, only the broad objectives, the main axes, clearly expressed, and a philosophy, were presented. The programme was built gradually, as the population's demands were expressed. It progressed step by step, each of the latter benefiting from the experience of the previous one, with detailed programming then being done by the professionals and villages, but conceived so as to allow each and all to express their capacity for initiative, decision-making and control. Although flexible, the approach was highly structured. It accepted, in totality, the involvement, role and motivation of families, and it also accepted the unexpected. It is not easy to

A rigorous approach

manage a programme of this sort. There are hazards, and it requires constant vigilance and strict control by the pilot team, including frequent critical evaluation encouraging progress, adjustment and deepening of the process.

Different attitudes of funders

However, the planning could only be modified because the funders accepted the idea of working within a flexible programme, and this points to a major change of attitude on their behalf. They accepted the overall framework and the broad objectives of the work, and the fact that the specific objectives would be defined as time went on. Their attitude was very positive during the evaluation periods, and they wanted these to be done regularly, be stimulating and concentrate not only on the achievements but above all on future prospects for systematization and conceptualization. They did not confine themselves to discussing financial problems, but greatly stimulated the team in its political reflections, and in propagating achievements and extending Andes to other parts of the country.

Research

Change affected the research sector and its relations with grassroots action. Andes demanded that researchers be in close contact with the population, and the subjects studied were chosen in accordance with the felt needs uncovered during community diagnosis. These included iron deficiency, the choice of new varieties of maize, and the prevention of some diseases affecting it. The researchers not only conducted the studies needed, but they also advanced some tentative solutions which were then worked on by professionals and families. Furthermore, the peasants acquired a research-oriented spirit : they participated in experiments on maize, for instance, and were encouraged to compare their traditional farming system with the system proposed, so as to measure the advantages, constraints and disadvantages, and to decide what option to take in accordance with their cultural and ecological situation.

It is our hope that Andes has given the families enough self-confidence for them to succeed in courageously expressing their specificity, and to be proud to be different. Will the peasant organization be strong enough to be able to continue to improve its living conditions, and to become a part of a changing world, without losing its identity ?

The changes will not stop here. They have sufficiently marked each of the actors for us to be sure that nothing will ever be the same again, and that the spirit of Andes will continue to move on, progress and be transmitted through training and planning of food policies.

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FOOD, NUTRITION AND DEVELOPMENT IN ECUADOR

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Andes, standing for food, nutrition and development in Ecuador, is a programme with a twofold objective : improving the living conditions and food consumption of rural Andean communities, and eliciting changes in training programmes on food, diet and nutrition at all educational levels.

For six years, Andes worked in some Andean villages and in the university, and its interventions can be subsumed under a few specific headings : ongoing, participatory diagnosis, multidisciplinarity, social organization, the pillar of the approach, based on self-management of action by people themselves, and the method, based on research/action/training.

This process of change, conducted by peasant families, college professors and students in the medical and agricultural sciences, government officials, field workers, the Juan César Garcia Institute and the International Children's Centre, has led to the development of a master's degree in food, diet and nutrition, under university supervision, and of a centre for the study of appropriate post-harvest technology and a centre for nutrition, growth and development. An overview of this experience is presented here.

"A meal at the marketplace". Picture by Doctor Michel CHAULIAC (Cambodia).

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